

# skin diver

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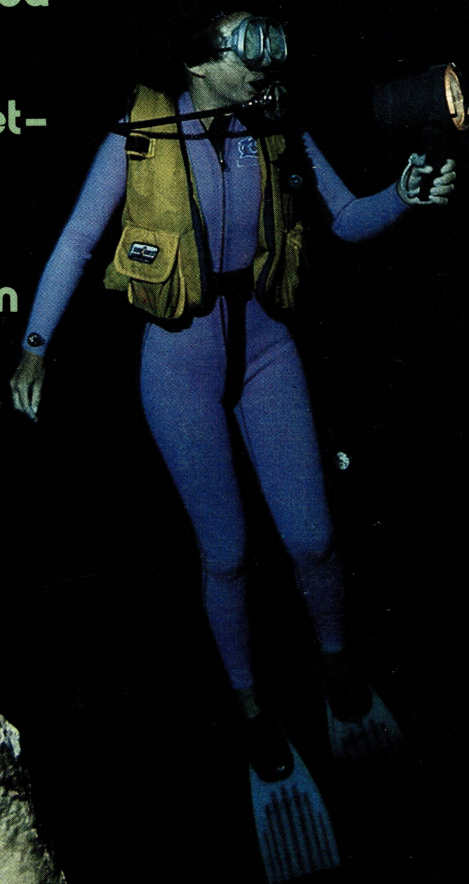


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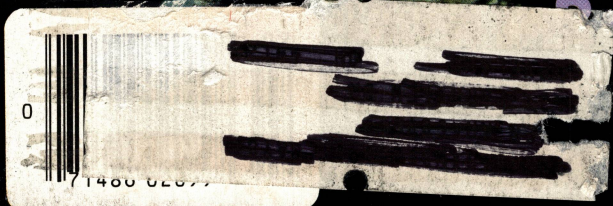
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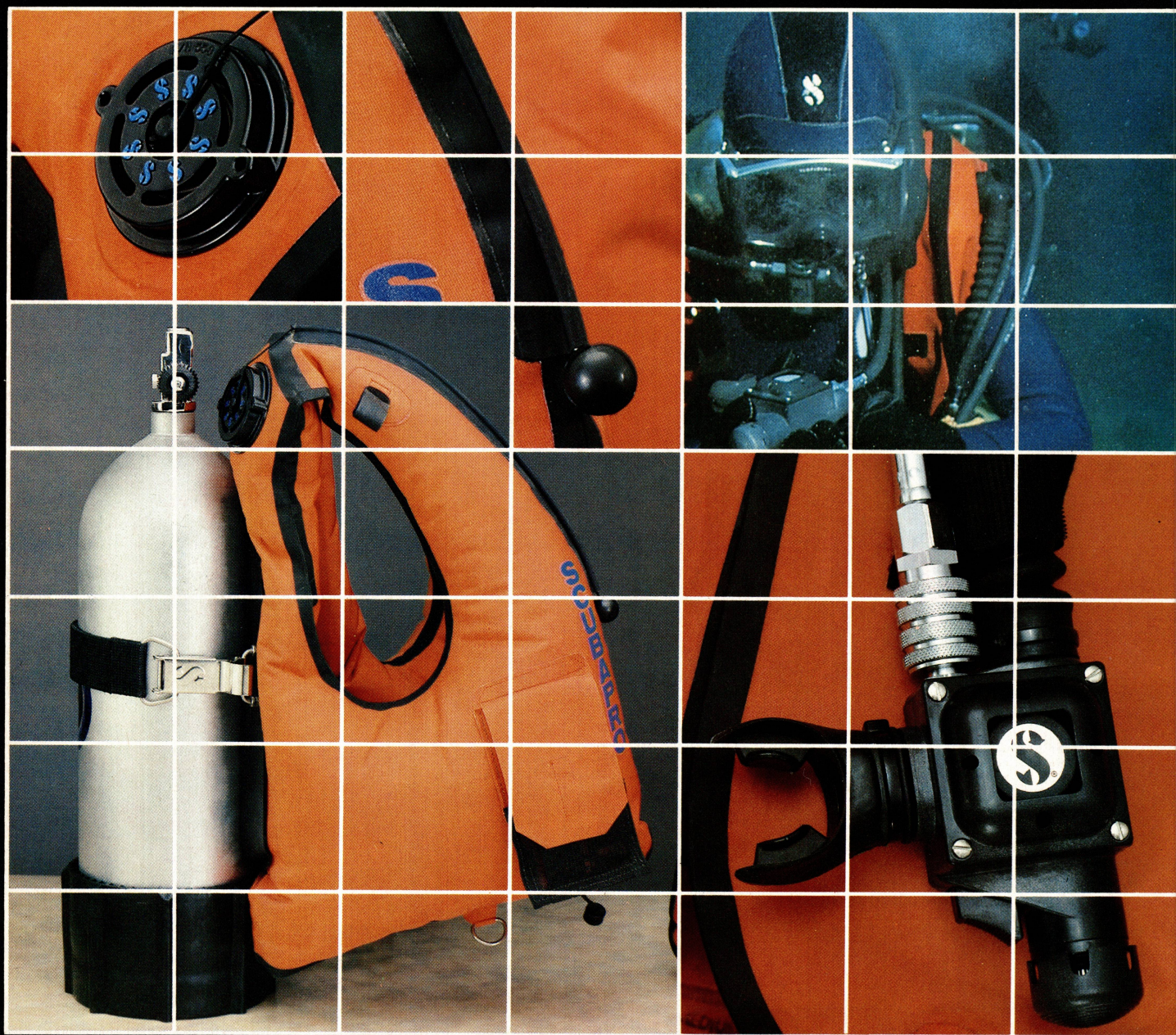
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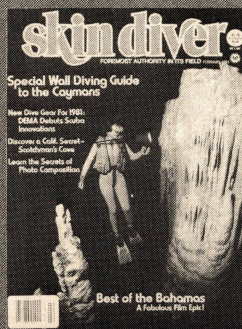
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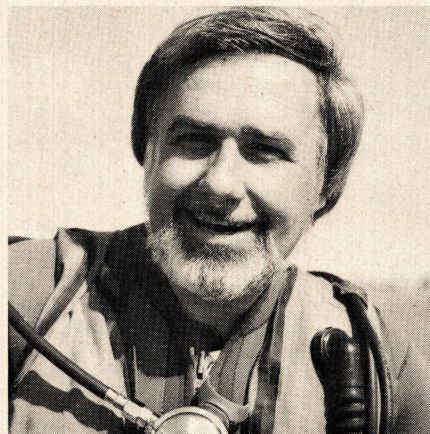
Sari McKenney examines a stalagmite thirty feet down at Ben's Cave, Lucayan Caverns, Grand Bahama Island. A Nikonos camera with a 15mm lens and an Oceanic 2003 strobe was used. Photo/Jack McKenney

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# SDM Editorial

## BY THE PUBLISHER



### SELF RESCUE — THE CHOICE IS YOURS

In last month's editorial we discussed the need for self-reliance in diving. While the buddy system is an excellent concept, there is danger in becoming over dependent on your buddy. Every diver should plan and carefully monitor his/her own dives as a safety hedge against the possibility of becoming separated from a partner. And one of the basic building blocks of the self-reliance concept is *self rescue*, the ability to extricate yourself from an underwater emergency — such as running out of air.

In a basic scuba class, divers are taught that the best way to avoid an out-of-air emergency is to never run out of air. Dive instructors stress the importance of constantly monitoring the submersible gauge and returning to the beach or dive boat with at least 500 psi remaining in the tank. While this technique is absolutely correct, divers should not be lulled into a false sense of security. Prevention is only half the answer.

Make no mistake about it — divers do run out of air. In fact, out-of-air emergencies may well be one of the most common emergency events in sport diving today. It happens far more frequently than most divers are willing to admit, and it is seldom discussed for fear of ridicule or embarrassment. If you dive regularly for five years or longer, the odds are that you will experience at least one out-of-air emergency. Being fully prepared for this eventuality can make all the difference in the world.

Why do divers run out of air? There are a variety of causes which contribute to out-of-air emergencies, but the basic reason boils down to this: Humans are not infallible. Diver error accounts for an estimated 99 percent of all out-of-air events.

**Miscalculation** is perhaps the greatest cause of out-of-air events. It is virtually impossible for a diver to precisely plan

out a dive he has never made before. There are just too many variables that cannot be predicted nor included in the dive plan. The diver may range too far from the boat or beach. He may encounter unexpected thermoclines, strong currents, or severe cold that robs him of precious air supply. He may go deeper than intended, be overweighted, or fail to take the shortest route back. Any combination of these factors can contribute to a miscalculation of air consumption and thereby result in the abrupt termination of the dive plan.

**Overloading** is another less frequent cause of out-of-air emergencies. Divers unexpectedly encounter heavy objects that they desperately try to drag back to the dive boat or beach. These enticing collectibles include such items as: lost anchors, prized portholes, cannon balls, or simply a heavy piece of brass. Other more subtle forms of overloading include: a bulging sack of lobsters, a goodie bag stuffed with clams or abalone, a heavy stringer of fish, or a bulky underwater camera housing bristling with accessories. All of these items represent additional weight and excess drag which can burn up an air supply in half the normal time.

**Distraction** is still another major cause of out-of-air calamities. In fact, distraction is regarded as a deadly killer because it catches the victim by surprise and increases the risk of panic. Divers frequently become absorbed in the beauty and fascination of the undersea world around them. They can easily lose track of time and even forget to monitor their tank pressures. This is a frequent problem with underwater photographers who concentrate intensely on framing and focusing their cameras. It also happens to wreck divers who are busily hunting for or digging up prized artifacts. Game divers often become preoccupied

with the business of chasing a runaway lobster or filling up their game bag with tasty tidbits.

When a diver runs out of air at depth, he/she has a safety margin of approximately 15 to 20 seconds. This is barely enough time to check equipment (for a false alarm), make an accurate evaluation of the immediate situation, and take the appropriate action for self rescue. No one can make this decision but the diver in trouble.

An out-of-air diver has several self rescue options available.

**Octopus rescue** is today considered the most desirable option for any out-of-air diver. It is a quick, simple and easy method of sharing air with your dive buddy while making an orderly retreat to the surface. However, octopus rescue requires the aid of a dive buddy who is not only equipped with an octopus unit, but also has a sufficient air supply remaining to support two divers. Perhaps the biggest problem with this kind of rescue is that not every diver is equipped with an octopus.

**Pony bottle rescue** is perhaps a safer, more dependable alternative to the octopus since it allows you to make an entirely independent rescue without the aid of a buddy. An auxiliary mini-tank complete with an extra regulator unit is strapped onto your normal scuba rig and carries an additional 12 to 15 cubic feet of air. The only disadvantage to pony bottle rigs is that they are expensive, bulky, and add extra weight to your already burdensome scuba gear. At present, pony bottle devices are popular with advanced divers who are engaged in high risk dive situations such as cold water wreck diving, deep cave diving, and ice diving.

**Buddy breathing** is one of the oldest and most widely taught methods for out-of-air rescue situations. This method has



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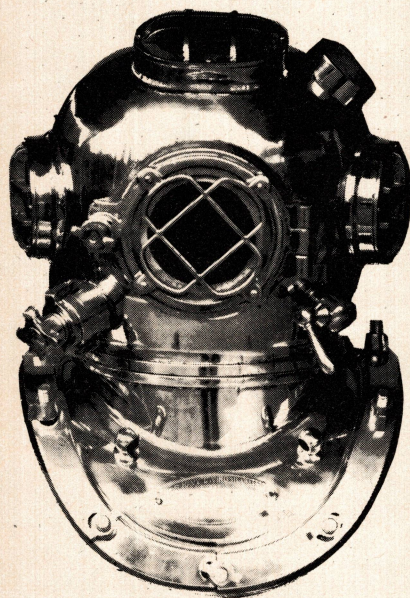
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## EDITORIAL

saved many lives in the past but has come under attack in recent years because of a number of double-death dive accidents. Buddy breathing can be potentially dangerous if both partners are not properly trained in this method and well-practiced in its technique. Buddy breathing requires periodic practice in order to assure smooth proficiency.

**Emergency swimming ascent** is perhaps one of the most controversial self rescue methods in diving today. Several years ago, this method was in hot debate among scuba instructor associations because of the inherent risk of air embolism. There have been a great many modifications to this method which have reduced the element of risk involved. The old "blow and go" method is obsolete. Today the student is taught to retain the regulator in the mouth while swimming slowly upward and breathing both in and out. Most instructor associations today agree that the advantages of swimming ascents far outweigh the risks. Most associations not only advocate the teaching of swimming ascents but now require it as part of certification.

Which method is best? Frankly, there is no such thing as the "best method" for self rescue. Each method has been time tested and proven to save lives. Each method offers advantages under differing circumstances. It is really the circumstances of the emergency which dictate the method to be used.

For example, there is little question that the octopus is the best way to go if your dive buddy is five feet away and happens to be wearing one. However, an emergency swimming ascent may be your only choice if your dive buddy is 100 feet away or completely out of sight. A situation which might call for buddy breathing is a dive inside a coral cavern or shipwreck, with a buddy who is not wearing an octopus. Needless to say, there are dozens of other scenarios which would dictate the choice of one self rescue method over another.

The important point here is that every diver should be fully trained and proficient in *all* self rescue methods available. Arguing about the theoretical advantages of one method over another will not solve the problem — if and when it comes. The more you know, the better your chances for survival.

If you did not obtain training (during your basic class) in all available methods of self rescue, perhaps it is time to learn about them now. This is especially true if you are not aware of the latest techniques for emergency swimming ascents. A lot has changed in the last five years and it is time to bring yourself up-to-date. 🐙

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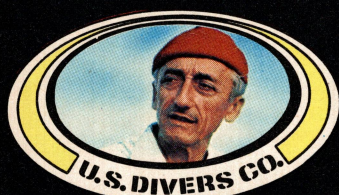
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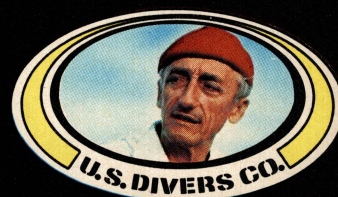
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**February 21** Sea State '81, Portland State University, Lincoln Hall, Portland, OR (Contact: Sea State '81, P.O. Box 774, Tualatin, OR 97062)

**February 21** 4th Great Lakes Shipwreck Film Festival, World Headquarters Auditorium of Ford Motor Co. in Dearborn, Michigan (Contact: Chuck Feltner, 166 S. Lafayette, Dearborn, Michigan 48124)

**February 21-22** North Carolina Marine Education and Resources Foundation Film Festival, Mission Valley Conference Center in Raleigh, N.C. (Contact: Shirley Kelley, Office of Marine Affairs, 417 North Blount Street, Raleigh, NC 27611)

**February 26** Underwater Photography-Canadian Style, Hart House Underwater Club, University of Toronto, Ontario, Canada (Contact: Glen Cauterman, NAUI 2032, 1294 Islington Ave., Apt. 304, Islington, Canada M9A 3K2)

**February 27-March 1** 13th FSDA Film Festival, International Inn, Tampa, Florida (Contact: FSDA Underwater Film Festival, Publicity Dept., C/O Debra M. Wright, 1704 Evans Drive, Clearwater, FL 33515)

**February 28-March 1** 7th Irish Open Festival of Underwater Photography, Limerick, Ireland (Contact: P. F. McCooole, Festival Director, Maricopa, Revington Park, Limerick, Ireland)

**March 10** Underwater Archaeology in Canada, Hart House Underwater Club, University of Toronto, Ontario, Canada (Contact: Glen Cauterman, NAUI 2032, 1294 Islington Ave., Apt. 304, Islington, Canada M9A 3K2)

**March 14** Boston Sea Rovers 27th Annual U/W Clinic, Boston University at John Hancock Hall (Contact: Glen Reem, 30A Rockville Ave., Lexington, MA 02173)

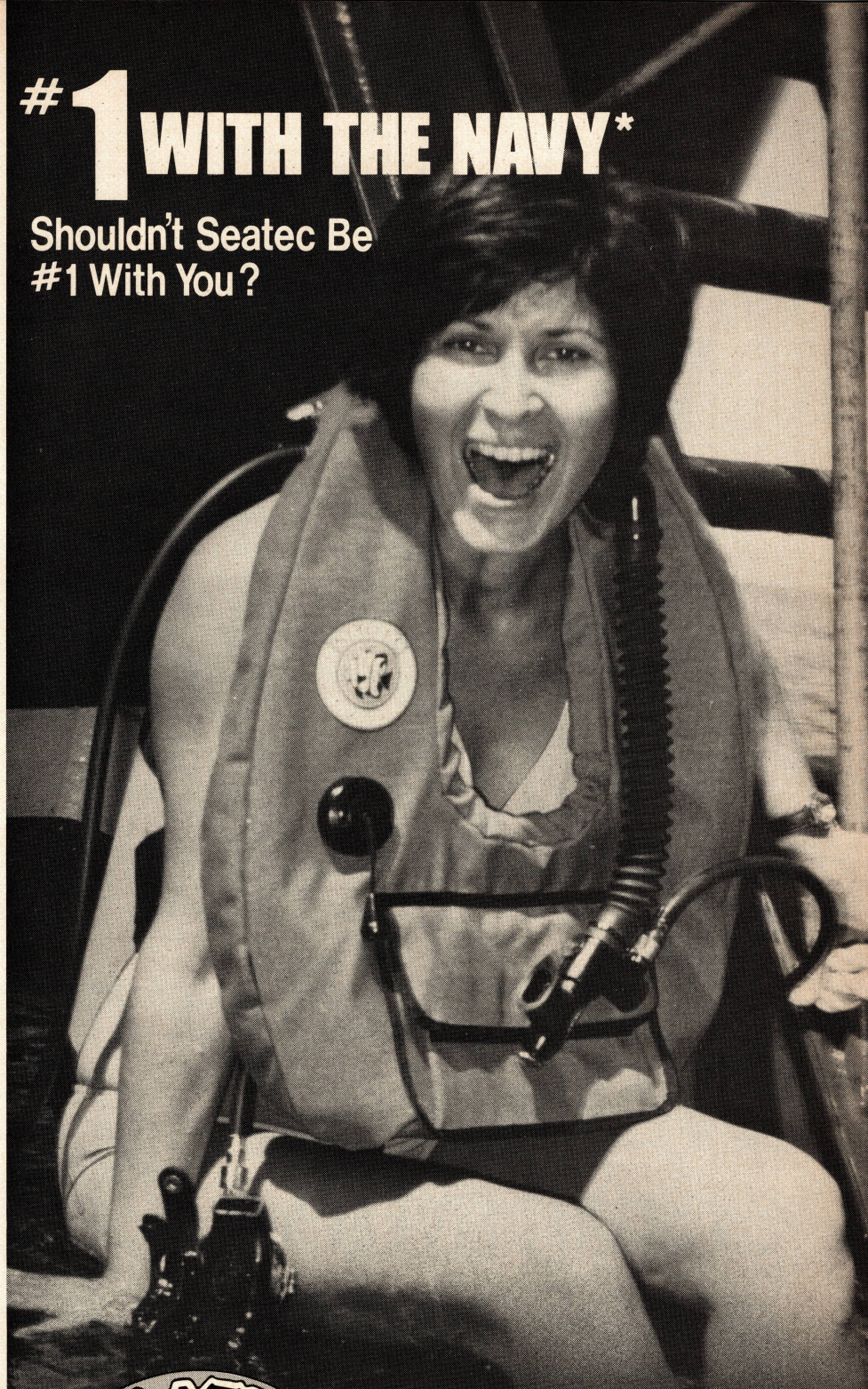
**March 25** Nitrogen Narcosis and Anxiety, Hart House Underwater Club, University of Toronto, Ontario, Canada (Contact: Glen Cauterman, NAUI 2032, 1294 Islington Ave., Apt. 304, Islington, Canada M9A 3K2)

**March 27-29** Man in the Sea Symposium, Seattle Center North Court Rooms, Seattle, WA (Contact: Man in the Sea Symposium, P.O. Box 4505, Federal Way, WA 98003)

**March 27-29** Underwater Canada '81, Skyline Hotel, Toronto, Ontario, Canada (Contact: Ontario Underwater Council, 160 Vanderhoof Avenue, Toronto, Canada M4G 4B8)

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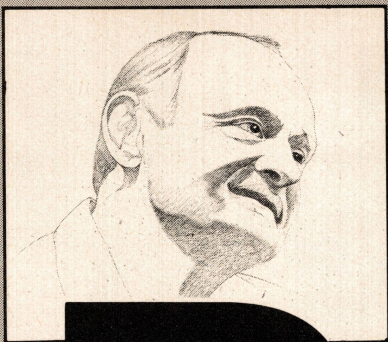


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# RX FOR DIVERS

BY CHARLES V. BROWN, M.D.

## SUB-SEASICKNESS

**T**he proper technique for vomiting (when unavoidable) while underwater, needs some new thought. Charles Vickers of Michigan has taken open wa-

ter, advanced and divemaster courses. Three different instructors have told him to leave his regulator in place and vomit through it. While this method usually works, we disagree that it's best.

Vomiting through the regulator can foul it. Some divers are uncouth eaters and don't masticate their food thoroughly. Large chunks of undigested food can block the exhaust ports. Though unlikely, it's conceivable that small, hard material might, like sand, block the air intake valve and cause freeflow. More important, at the conclusion of vomiting the regulator will contain vomitus instead of air. Even after purging (if the ill diver thinks to do it) some could remain and be drawn into the lung with the next big inhalation.

We prefer to remove the regulator from the mouth and replace it after vomiting.

absolutely essential to dive safety, and no student should receive a C-card until he's learned to do it automatically.

**Question:** Sheryl Knowles Fuller of Sunnyvale, California, donates blood about every two months. She'd like to know how soon after diving she can safely part with the blood, and how soon after donating she can dive.

**Answer:** It's safe to give blood as soon as you're warmed up and well rested, and the need for food and water has been supplied. In many cases that will be several hours; in some, the next day. Soon after certain dives, venous blood (which the bank takes) contains a large number of micro-bubbles and its clotting characteristics may be altered. Its suitability for banking has not been investigated.

If you're healthy and feel well, it's prob-

ably safe to make a conservative, non-arduous dive several hours after giving blood. Lest this advice provoke cries of outrage, we'll try to defend it. First, one of the commonest complications of rapid blood loss, a tendency to faint when up-

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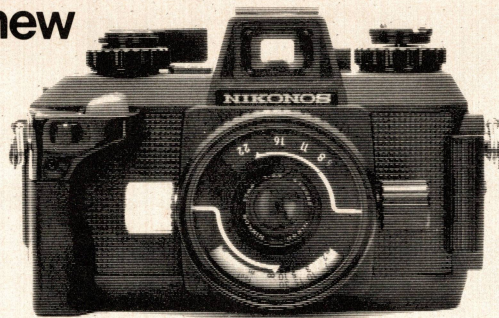
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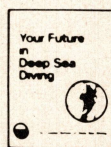
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
## RX FOR DIVERS

right, won't occur in the water because the hydrostatic pressure gradient balances that in the body. In other words, your blood won't pool in your legs. Second, when you're immersed the hydrostatic support, plus cold-induced vasoconstriction and any squeezing by your wetsuit, causes a shift of more blood into your central body than the bank withdrew. Therefore, blood pressure can be expected to remain normal.

This still leaves some reduction in oxygen carrying capacity. The bank takes about one tenth of your blood. The lost fluid is replaced quickly, but the lost red cell mass more slowly, so the blood becomes more dilute, with a lower hemoglobin concentration. Because of various compensatory mechanisms, and the increased oxygen partial pressure in compressed air, we estimate that oxygen carrying capacity won't drop more than about five per cent — not important except for strenuous exertion.

**Question:** You thought you had trouble? Listen to this from Bob Kersey of Sacramento: "People are always writing for advice about broken bones or a blocked this or a clogged that, so I will too. When I was five my brother Bill (accidentally) kicked the car in gear and ran over me. Broke some ribs and an arm, and almost tore off an ear. At eight I was electrocuted with 12,000 volts. It stopped my heart and made me fall 40 feet out of a tree. The impact started my heart up, but broke both legs and an ankle and the other arm, and put a hole in my belly where my belt buckle was. High school football gave me two minor concussions. In the Air Force I tried to catch a 500 pound bomb that was about to fall on a friend, and wrecked two disks in my back. Later I caught shrapnel in the belly and lost a lot of intestine and a piece of bladder, and had some private parts rearranged. The surgeons found a large hernia, too.

"I don't want to stop diving. It seems the only safe place is in the water (though I passed out and nearly drowned twice). While diving I never have the slightest ache or dizziness or anything, but on land my bones creak and rattle and I can't sleep. Do you think diving causes this, maybe because of all my old injuries?"

**Answer:** No, we don't. The batterings you've absorbed are grounds enough for post-traumatic arthritis and chronically complaining muscles and connective tissues — what grandpa used to call rheumatism. Diving removes the stress of gravity, provides the anodyne effects of cold and nitrogen, and distracts your mind from your misery. Stay with it if you promise not to pass out and drown. 



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# BEST of the bahamas

Cinematographer Jack McKenney  
documents top dive adventures  
By Jack McKenney

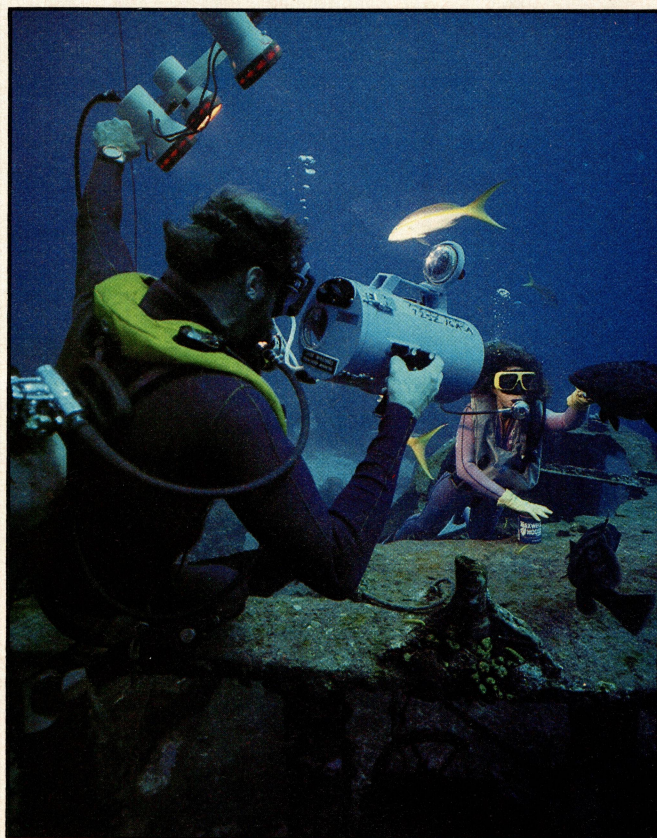
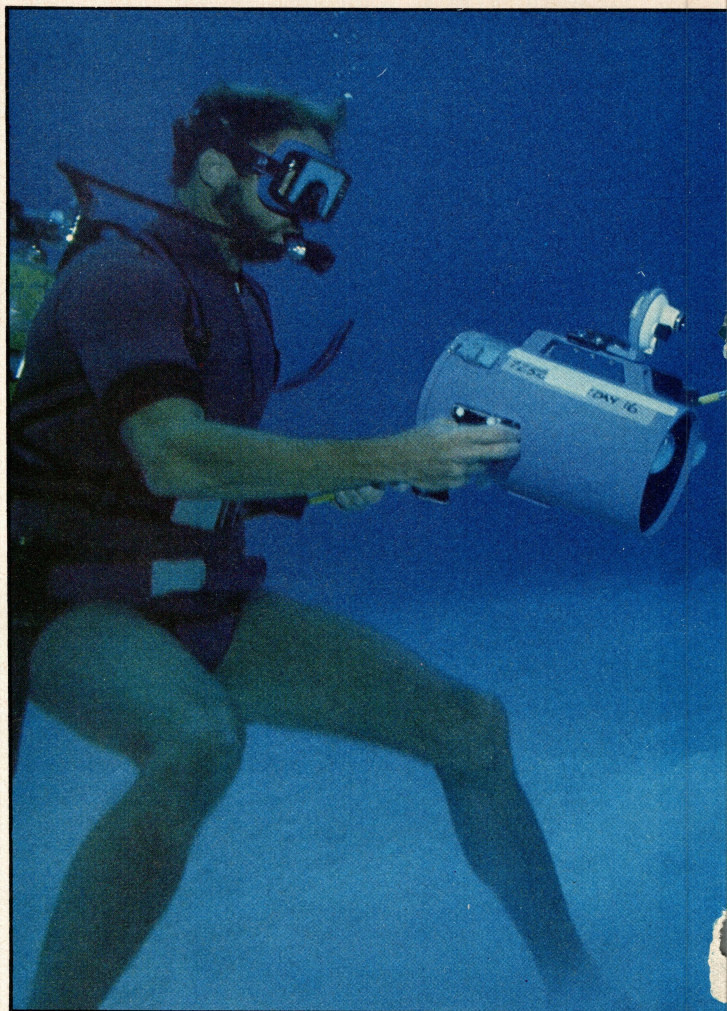
**B**ack in the mid 60's I lived and worked in Freeport Grand Bahama Island. Because of this I felt I had already seen much that the Bahamas had to offer underwater. Thus, when the opportunity arose to make a film there, I was sure that it would be basically a shallow reef drop-off, pretty fish type of thing.

However, when I started planning the project, I had long conversations with both George Hartwell, Coordinator of Sports and Aviation for the Bahamas Ministry of Tourism, and Paul Tzimoulis, Editor/Publisher of SKIN DIVER. Together, these two men probably know more about diving in the Bahamas than anyone else. I began to realize that there was a tremendous variety of underwater subjects.

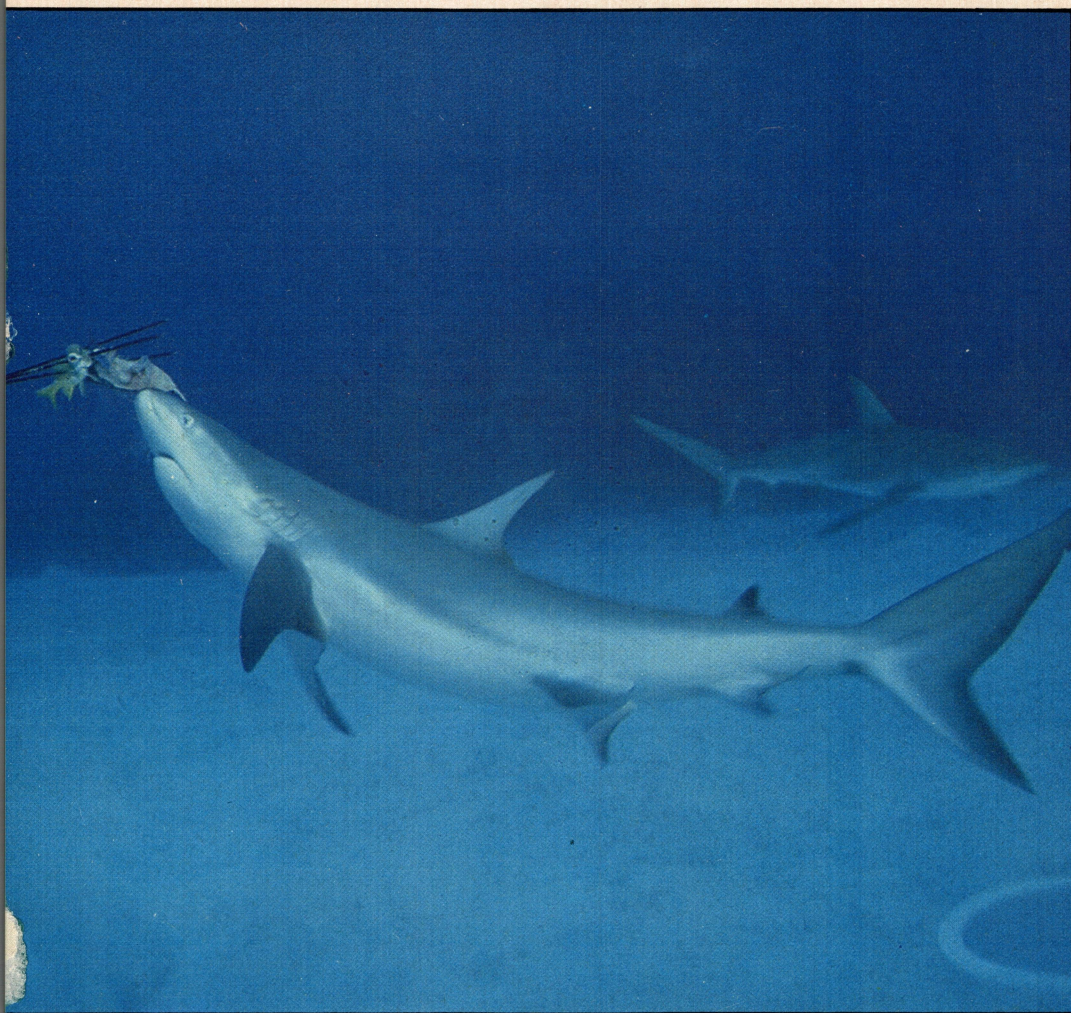
We decided to make a one-half hour travel/adventure film depicting the very finest the Bahamas has to offer. When it was completed I could use it in my lecture series and in an upcoming TV series that Bob Abrams, my wife, Sari, and I are producing. The three of us and my son, John, were the film production team for all seven weeks. George Hartwell took care of all the arrangements, which included moving 1500 pounds of luggage from place to place. He accompanied us for three weeks while his assistant, Mike Jervis, took over in Nassau for him.

We first met with Jon Planc and Slosson Viau of Western Airlines and they agreed to assist us with transportation to and from the Bahamas. Western flies from Los Angeles to Nassau, with a 50 minute layover in Miami, every Friday and Sunday. The flight leaves L.A. at 7:45 am and arrives in Miami at 3:30 pm. From there, it's on to Nassau. Roundtrip air fare is \$494, which certainly puts the Bahamas within easy reach of West Coast divers.

We began filming in Nassau, in order to provide both a short historical and a current background overview. Certainly, more tourists visit Nassau in a given year than any other island in the Bahamas. Its fine hotels, beautiful sandy beaches, shopping, gambling, water sports and sightseeing are more than enough to content any







Jack McKenney films close-ups of a bull shark feeding at Stella Maris. A speared fish is held just in front of the wide-angle camera lens. As seen here, the shark cooperates.



The barge, in 70 feet of water, provides a good setting for Sari to feed the pet grouper. Divemasters have fed these pugnacious fish for years. The wreck is located off Small Hope Bay on Andros Island in the Bahamas.

Sari takes over the helm of the barge from one of the area's smaller natives. The fish, being accustomed to divers feeding them, would rise as the anchor dropped toward the bottom.

George Hartwell (of the Bahamas Ministry of Tourism) explores limestone formations at Ben's Cave in the Lucayan Caverns.



photos/Bob Abrams



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vacationer. Nassau does offer some fine wall diving and an ocean blue hole teeming with fish, but if you're the sort who prefers an out-island atmosphere, or unequalled diving, it's the out-islands you'll want to visit.

Our first stop after seven days in Nassau was at Small Hope Bay at Andros. Andros is the largest island in the Bahamas and, for its size, one of the least populated. Dick and Rosie Birch, two delightful Canadians, run a casual and relaxed resort. Small Hope Bay has 20 cabins and can accommodate about 40 divers. But they try to keep the dive vacationers to no more than 20.

I had never visited Small Hope Bay before but had a standing invitation from the

cans and mope when all the food was gone.

We worked the barge for three days and on the last day a large moray appeared. Under the bright lights its skin became a vibrant satiny green. It slithered up out of the wreck, very interested in the fish we were using as grouper food. This beautiful animal was rather docile and John had no trouble at all in feeding it. But during one scene, I glanced up from behind my camera to see another large eel headed straight for Bob. Instinctively, Bob turned around just as the eel came up alongside him. It ended up chasing him five feet off the wreck. Then John began to feed it. It proved much more aggressive than the first eel. After its hunger was somewhat satisfied, we got an interesting scene of the two eels intertwined and feeding together on the fish. At one point John became a little too daring while feeding the aggressive eel, and it bit one of his fingers.

After five days on Small Hope Bay we were delivered by a twin engine Beech airplane to one of the southernmost islands in the Bahamas — Crooked Island. Pittstown Point Landing there is a delightfully small resort that caters primarily to private pilots. Tom McKay, a congenial young man from Milwaukee, manages the resort. Tom has three 18 foot aluminum skiffs, two inflatables and 15 tanks. He prefers divers on a one, two and three person basis rather than in large groups. Superb wall diving is only five minutes away from the lovely white sand beach in front of his cottages. Much of the wall begins in 35 feet of water, has lush craggy coral and sponge growth, and is very similar in structure to the north wall at Cayman. It drops down to about 110 feet and then slopes gently to much greater depths. Giant purple tube sponges are frequently seen, along with a myriad of other brightly hued sponges. During one night dive I found the shank and ring of an ancient anchor in 90 feet of water. There was a huge black sponge sitting on top of the ring and from above it was impossible to determine that a man-made object was there. I suspect the anchor might be 12 to 15 feet long.

I wanted to get a conch fishing sequence from the point of view of the conch, so Tom rounded up a couple of local fishermen; Bluebird and Hot Pepper. The fishermen sculled their tiny boat on the sand flats and hooked up a dozen conch while we filmed them at work. The conch is a staple of the Bahamian diet and is served on most menus throughout the islands. The cuisine Tom prepared for us was exceptional — conch chowder is one of his specialties.

Whenever I happen to be filming, I invariably run into people who insist that if I want sharks they know a place where I'll

find as many as I want. Once a fellow even told me there were so many sharks on one particular pinnacle that I'd be lucky if I could get into the water before they ate the stern drive. As expected, that turned out to be a dud. Naturally, I was a little skeptical about the supposed shark activity at Stella Maris on Long Island. But a surprise was in store for us! Jorg Friese, from Germany, proved to be a most efficient and friendly host. He is the manager of Stella Maris Inn. He and his two partners have turned this Long Island resort into one of the more popular vacation destinations in the Bahamas — especially for Europeans. I questioned Jorg about Shark Reef and his authoritative manner reassured me.

Shark Reef is a 20 minute run by boat from the marina. Coral heads rising eight to ten feet from a 35 foot bottom provide perfect bleachers from which divers can view the shark action. Generally, Jorg or one of his dive guides will spear a fish in another area and bring it down on the end of a spear. Three minutes or less after the divers have entered the water the first shark shows up. If the sharks move in quickly and take the fish the guides may spear another one. When the fish is gone the sharks hang around for awhile, giving the divers a last minute opportunity to take some photos.

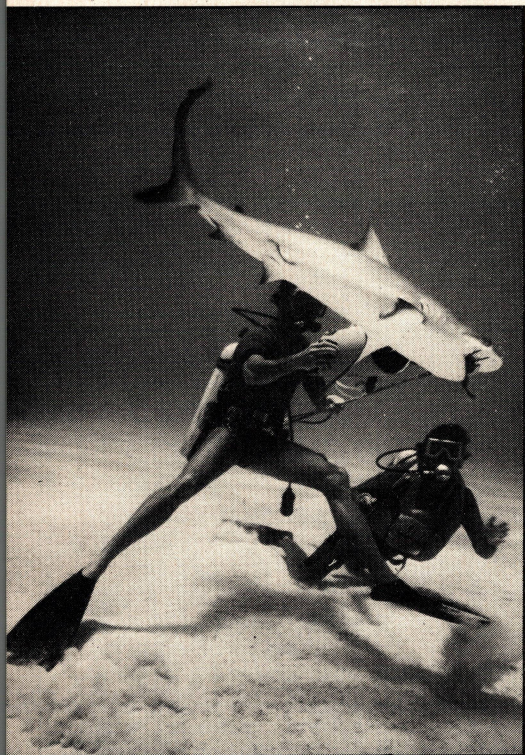
I wanted to insert a shark sequence in my film to illustrate that sharks are really not the monstrous man-eaters Hollywood has made them out to be. Jorg and his guides have been making this shark dive approximately twice a week for two years and no one has ever been hurt. Because we were making a film we had to work much more closely with the animals and do things with them that aren't normally done.

The first day we worked cautiously. All of the animals were bull sharks (*Carcharhinus leucas*).

By nature, sharks are not aggressive toward people. They are only interested in feeding on their normal food fare, such as the dead fish we carried with us. Jeanie Fletcher, from Connecticut, joined us for a couple of days, so at times there were eight people on the bottom. Working with sharks was a first time experience for Sari, George, Bob and John, and I had only limited experience with bulls. We would stop at a distant reef on our way to the site to spear many fish, to ensure enough of a supply for a full work day. When the sharks realized that we were there to stay, and that dead fish kept magically appearing from a plastic bag, they became bolder and more numerous. At times we had ten sharks scurrying in to be the first to snatch the bait off the spear.

We set up one scene where Bob and I were just five feet apart, with a speared

photo/Bob Abrams



**A bull shark (*Carcharhinus leucas*) takes a fish from Jack McKenney's pole spear. At times up to ten sharks would contest for bait.**

Birches to do so. I had heard that the wall diving was very good, and I was anxious to dive the sunken landing barge in 70 feet of water and film the tame grouper. For years divemasters have been feeding these large fish. As a result, as soon as an anchor was thrown in near the barge, one or two fish would swim up to greet us. The clown-like Nassau and yellowfin groupers pugnaciously charged John and Sari, demanding food from cans they were carrying. It was quite comical to watch these large fish nip at fingers, pull at inflator hoses and position themselves in front of the divers' masks. They would poke their big snouts into the



fish between us. This was probably the most dangerous scene we attempted. The animals were a little confused at times, and either one of us could easily have been bitten had it not been for John who bumped them off when they came in too close. Certainly, the Stella Maris shark action proved to be one of the more exciting aspects of the trip.

Our limited time only allowed for three days at the Riding Rock Inn, San Salvador. This island has long been popular among divers, and the Inn's dive operation is very well organized. There are four large Flattop dive boats and a dive shop and photo lab right next to the dock. Dave Woodward, resident pro, operates a camera rental facility and processing lab where divers have their film processed overnight.

If you're looking for fish portraits and macro photography then Snapshot Reef is the place to go. The fish are well fed. Grouper and squirrelfish eagerly pose in return for food. In all my years of diving the Caribbean and Bahamas, I've never seen a nudibranch or frilly sea slug. I told Al Zamrok what I needed for some macro work and within half an hour he had two such creatures for me. Snapshot is about ten minutes out of the marina by boat and only ten feet deep.

Another beautiful dive site is French Bay; the wall begins in just 40 feet of water. It is ruggedly cut with fissures and caves leading down from the top of the coral out to the face of the wall. Snapshot and French Bay are only two of the many fine sites available for diving at San Salvador.

The next leg of our adventure took us to Harbour Island, part of the Eleuthera Island area and miles from San Salvador. We stayed at the lovely and very comfortable Valentine's Yacht Club, a hotel operation decorated in a combination of Early American, Old English and island flavors. Jim Valentine and his divemasters, Ron Lipman and Dolly Norden, are the resident pros. Ron hails from Lexington, Kentucky and was very helpful.

Our main objective while staying at Harbour Island was to film the Current Cut between Current Island and North Eleuthera. During the tidal change the water flows rapidly from the Atlantic side to the Caribbean side through a 200 foot wide cut. The maximum depth is around 35 feet. If caught at the right time, the current flows at a speedy eight knots. We jumped in off Jim's boat and let the current carry us for the half mile run, an exciting 10 to 14 minute ride. Unfortunately we were there when the tidal change took place at around 8:53 am, when an overcast sky resulted in poor lighting conditions. But, by using fast film we were able to effectively shoot a fun sequence. We made seven runs through the cut and on

numerous occasions spotted big eagle rays beating their way against the current. All types of reef fish, barracuda and nurse sharks were sighted.

We made another very interesting dive with Ron and Dolly at the Blow Hole. North Eleuthera is a long narrow island and in some parts is quite high, jutting up out of the sea 50 or 60 feet. At the Blow Hole huge boulders, each weighing a few tons, have toppled into the water and created caves and grottoes. We jumped into greenish water with visibility no more than about 40 feet, and I wondered why Ron insisted upon showing us this spot. But as we swam into the huge underwater cave and saw the unique rock formations, I was eager to press on. One large boulder, about 25 feet in diameter, has a hole in it which is large enough for a small car. Two other large windows in the rock make it appear as though sculpted by a modern day artist. Additionally impressive was the fish life. Heavy surge runs in and out of this area and as a result, only the hardiest fish live here. French angels grow especially large, and giant green and red parrot fish wander through the maze of rock. At the far interior of the cave is the Blow Hole, an opening in the rocks where the surge washes through. Great billowing clouds of foam surge into the bottleneck, obliterating one's vision, and then run out as the water recedes.

I wanted to get a scene of a diver with a light swimming up into the edge of the foam, disappearing momentarily, and then reappearing 20 feet away on the other side. John, who's quite daring, volunteered to try it and the scene worked out fine. But unsatisfied with the results, he wanted to try again. This time he got sucked up over the lip of the opening, was thrown out and then sucked in again; cutting his hand on the sharp rocks. Frantic moments were spent waiting for him to exit; the few seconds it took seemed like an hour. It is an exciting dive, but one should be cautious.

Before we had arrived at Harbour Island, Dolly's father had built a shark cage in the states and shipped it to Valentine's. We went to a place called Dutch Bar, a sand bar that rises to within 60 feet of the surface, to try out the cage. Jim, not an excitable or exaggerating type of person, felt quite sure that we were going to have a dive where the sharks are so thick we'd have to push them out of the way to get into the water. He told us of the 10 to 12 foot tiger sharks that frequented the area. "Here we go again," I thought, "another great shark dud." After finishing up at the Current Cut we met Jim's other boat at Dutch Bar. Bill Crawford, who owned Key Largo Diving Headquarters and is setting up an underwater photo business with the Valentines, joined us for the afternoon. We lowered the cage

into the water and started to chum. Forty-five minutes passed before the first shark showed up; then another, and finally two more. They weren't ten foot tigers, but a couple of them were six to seven foot dusksies. Conditions were perfect — the sun was shining, the water was crystal-line and blue, and the sharks were beautiful. Again, not having had experience with these specific sharks we approached them cautiously. But within a short while we were getting extreme close-ups of the bigger animals headed right for the camera lens. John and Sari kept busy bumping with their shark billies while Bob, Bill and I shot pictures. It was Ron's first shark encounter and he was clearly excited by the action. Jim and Dolly, inside the cage, were also excited by the sights. Jim later told me they intend to add a shark dive to their dive itinerary. In that clear blue water, it would be a wonderful experience for U/W photographers.

Once again the twin engine Beech plane arrived to pick the four of us up — along with our 40 cases of equipment. George had gone back to Nassau the previous week, and would meet us again in Freeport. In 1965 I had moved to Freeport with my family, and opened up the Underwater Explorers Club with Dave Woodward and Chuck Petersen. It had been almost ten years since I had been back to my island home and I was anxious to see some old friends. John Englander, president of NAUI, and his partner, Jack Brackett are the current owners of the club.

About the time I moved from the island, a fellow dive guide and friend, Ben Rose, was the first diver ever to explore what is now called Ben's Cave. I had heard many excellent comments about the beauty of this inland blue hole and thought a dive there would be exciting. Wherever one travels and dives, it's generally a rule of thumb that the amount and number of exciting and profitable dives is directly proportional to the enthusiasm and expertise of the local dive guides. Although not on staff at the club, Dennis Williams occasionally runs UNEXSO cave trips for divers. Dennis is a flying instructor by profession, and has lived on Grand Bahama Island for the last 12 years. An exceptionally bright and meticulous man, he is perhaps the world's foremost authority on cave diving.

To reach Ben's Cave, one must drive for one-half hour toward the east end of Grand Bahama. We parked at the side of the road and trekked inland through the bush for 100 yards. The cave opening is about 50 feet in diameter and well hidden by the surrounding trees and greenery. Dennis usually dresses at his van and walks in wearing all his dive gear. We enlisted the aid of Simon Clement and Ian Wadland to help us carry in the 120



pound generator, cables, lights, underwater cameras and dive equipment for our crew of six. The cave is bell shaped — from its 50 foot diameter at the top, it drops down for ten to 12 feet where it expands to 100 feet in diameter. A good third of the cave consists of a rocky top-side platform where we could place our gear while dressing. The water in the cave is smooth and transparent. We were able to peer down into its depths. Dennis brought a ladder so we could climb down to the interior.

The Andros cave system is exceptionally beautiful but I wasn't really prepared for what we were about to see. The main room in Ben's Cave is entirely underwater. It's about 30 feet deep, 50 to 60 feet across and 100 feet long. Huge stalagmites rise up from the floor and are eerily silhouetted when backlit by a dive

passageways.

There are two or three ways into the Burial Mound. From one open air cave we swam to it, then it was a simple matter to duck under a ledge and emerge into this sacred place. When we came up into the Burial Mound room — the top four or five feet are in air — I saw ahead of me one of the most beautiful sights I had ever seen. The mound was 40 feet away and between us, growing down through the porous rock (through the four foot air space), were tree roots, ghostly framing the mound. From an air cleft above shafts of sunlight dappled the water and danced atop the mound where the remains of the Indians had been discovered. Above us, the entrance was rimmed by lush foliage and trees. Numerous bats skittered about.

Our seven weeks was rapidly coming

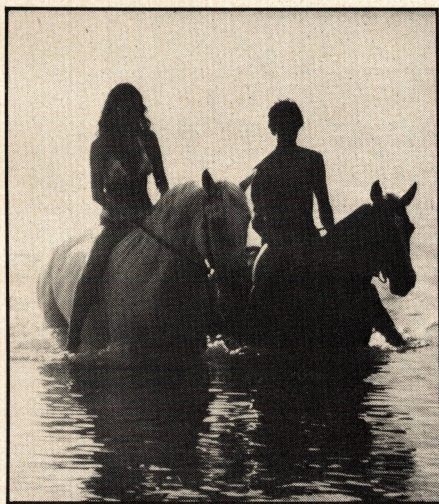
Bahamas were a crown colony 25 years ago. Dave purchased a beautiful six to eight acre island from the Queen. He originally came to the Bahamas with \$200 in his pocket. By working extremely hard he now has his own island paradise. His well-designed, naturally air-conditioned home sits on top of Parrot Cay. The island is dense with mango, banana, orange, lime, pineapple and avocado trees. A great little harbor was literally hand cut out of the rock and is extremely well protected from the elements. Here Dave has an outboard marine service and a dive shop. In addition, there are two delightful cottages on remote areas of the island that he rents out. Dave does not cater to large groups of divers, but instead prefers families or couples. Each cottage has a Boston Whaler, and divers may go out on their own after they become oriented.

We took aerials of Bimini and of the Exuma chain — one of the most beautiful string of islands in the world one can observe from above. The turquoise, emerald and bright blue waters melting from long stretches of sandy cays into deep blue ocean waters take your breath away.

We also visited Preachers Cave on Eleuthera. This is where the very first white settlers landed in the Bahamas. The year was 1647 and the Eleutheran adventurers had been religiously persecuted in Bermuda. Here they found freedom to worship as they pleased and a beautiful surrounding in which to live and grow. We filmed Freeport's International Bazaar. We continued our conch fishing sequence off Chub Cay — thus showing an industry that provides a basic food staple for the Bahamian people.

We wanted to dive and photograph the large cannon on the *USS Adirondack* off Abaco but we didn't have time. We did, however, film an interesting train wreck off Harbour Island. It sank during the Civil War while being towed on a barge from the U.S. to Cuba. We also visited Conception Island, where there is a phenomenal drop-off. Additionally, on one end of the island is one of the more fantastic and unique elkhorn coral reefs I have ever seen. The water was a bit murky and surgy this day, but that, in combination with a reef that was old and at the same time young, added up to a spectacular dive.

In the span of seven weeks we weren't able to see all of the underwater sights the Bahamas has to offer, but during that time I feel we captured as great a variety of diving as could be accomplished. My crew and I returned home exhausted. We were satisfied that we experienced much that the Bahamas has to offer, yet happy to know there was still a tremendous amount left to see on our next visit to this incredible country of 700 islands. ➤



photo/Jack McKenney



**Above, Western Airlines flies from Los Angeles to Nassau, stopping in Miami, every Friday and Sunday. Left, there are other ways to enjoy the tropical waters of the Bahamas.**

light. Watching John, Sari and Dennis swim down with the lights was spectacular. Most of the walls are what Dennis calls "popcorn" rock. The limestone is extremely porous and looks like a heap of popcorn. Dennis told me that he often comes into the cave, sits on top of the main stalagmite (it measures about eight feet by two feet across), and spends the entire dive just looking around.

Not far from Ben's Cave is another cave called the Burial Mound. Inside are the remains of seven ancient Arawak Indians, uncovered by archaeologists a few years ago. The cave can be entered from above ground, but swimming in underwater is more spectacular. It then becomes a cave dive, however, and should be led by an expert such as Dennis. Because of Dennis' tales, I wanted to recreate the discovery of one of the Indian skulls. So John, Dennis and I made the five minute swim underwater from Ben's Cave over to the burial site. The water was translucent and still; our lights lit up narrow grottoes and

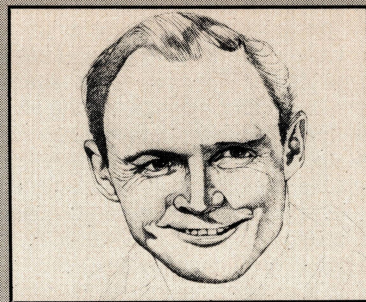
to an end, and our shallow reef and much of our night diving sequence weren't shot. George felt sure that it would all come together in Chub Cay, a very popular fishing resort, and for the last few years, a fine dive resort, too. Both George and Paul Tzimoulis assured me that we would find great schooling fish action. Chuck and Pris Strong, the husband/wife divemaster team, took us to two reefs: A beautiful shallow reef called Mama Rhoda, and a deeper 40 foot reef called the Oasis. We were blessed with clear water and the sequences we required were indeed shot here.

On one of our last days John, Sari and I flew over to Abaco. Unfortunately, our time had run out for setting up any more dive sequences, but I wanted to film Man O' War Cay where boats are built as they were 100 years ago. We also wanted to film the candy striped lighthouse at Hope Town. Dave Gale, one of the most delightful people we met along the way, and the man who runs a small dive operation called Island Marine, is probably envied by everyone who knows him. When the



# Technifacts

BY E.R. CROSS



**Q**uestions received from Technifacts readers reflect the various ideas sport divers have about the commercial diving field. From the contents of letters, it is apparently assumed that any diver who makes money at any sort of diving operation becomes a commercial diver. This is not the context of Technifacts. Rather, it is assumed in this column that commercial divers are not paid for diving but for *accomplishing a specific task or performing a specific service while underwater*. Also that a diver becomes more employable, useful and valuable to an employer only as he develops the ability to perform more skills and services.

The current series of Technifacts deals with skills an underwater worker must have and with the tools and equipment that must be used to perform specific services and tasks. This column is not intended to replace formal training in either diving techniques or in the various skills of journeymen commercial diver. Technifacts serve as a conduit for the exchange of information between those sport divers who have entered the field of commercial diving and need to broaden their work related skills. Finally, it is hoped the information presented will also serve to make sport divers aware of both the diving and the mechanical skill requirements for commercial diving so they can better evaluate their chances of success in this demanding field.

## DEALER/INSTRUCTOR

A reader wrote recently stating, "I am planning on becoming a professional diver, mainly a dealer and instructor. What courses should I take to pursue such a career?"

This area of diving is not a field within the expertise of Technifacts. Sources of information in this area include: NAUI, P.O. Box 630, Colton, CA 92324; PADI International College in California, Inc., 1310 Rosecrans Street, San Diego, CA 92106; PADI Headquarters, 2064 North Bush Street, Santa Ana, CA 92706. NAUI and PADI Headquarters can probably provide the name of an organization in your area offering services in this field.

## COMMERCIAL DIVING TODAY

That is the gist of several letters received. I suppose after over 40 years in the dive business I should know the magic words that, when applied to an individual's effort, would mean automatic success. Unfortunately there are no magic words or even magic methods to instant success in commercial diving. Beginning divers usually have to suffer through several years of apprenticeship before they are accepted as qualified divers.

There are, however, ways to shorten the "few years" of apprenticeship. One of these, and possibly the most important, is to develop a good educational and practical background in as many mechanical fields as possible. Diving is underwater mechanics of various sorts: welding, cutting, rigging, pipe fitting, carpentry, concrete work, using explosives, and salvage and recovery. The second way to shorten an apprenticeship is to graduate from a commercial dive school. A recent survey of commercial dive schools found 23 such organizations on a worldwide basis with 12 located in the United States. Several leading schools advertise in SKIN DIVER each month.

In an article in the Oil and Gas Journal, a senior vice president of one of the leading U.S. dive companies stated, "A majority of our new diver candidates come to us from commercial dive schools which do a credible job screening and provide basic training."

Throughout the world there are a dozen large companies that perform about 90 percent of all underwater work in connection with offshore oil exploration and development. These dozen companies employ an estimated 2300 divers and have an additional 4500 employees as support personnel.

Basically, work in the offshore oil industry involves diving from the drilling rigs and ships during development; construction diving in connection with distribution (pipelines, risers, etc.); the maintenance and inspection of pipelines, drilling and production structures;

and in connection with cathodic protection systems. Nearly all, probably 90 percent, of the work in the first two categories is done by the dozen or so large dive companies. The many smaller companies, having less support personnel and equipment, are generally contracted to perform work in the latter category.

## EMPLOYMENT OUTLOOK

On a worldwide basis and in all categories, diver employment is in a depressed state. The degree of depression depends on what field of diving is being considered. Basically, as we stipulated previously, a commercial diver is employed to perform a task or service. Those tasks and services can be performed in the areas of offshore oil industry; construction of bridges; docks, dams, etc.; in connection with marine research; in connection with marine salvage and cargo recovery; and in the harvesting of ocean products.

In the offshore oil industry there are more oil drilling rigs and ships in use today than ever before. However, in spite of this, there are fewer divers being used today than five years ago. This is primarily because drilling and production systems of various kinds have been developed that do not require the services of a diver. More and more equipment is remotely or automatically controlled, or is operated in a "shirt sleeve" atmosphere by men transferred to depth and locked into the production system at atmospheric pressure. Such operators are preferably specialized technicians and are not necessarily divers.

In marine construction the number of diver jobs varies with the amount of construction in progress. Most such construction is financed by city, county, state, or federal funds. With today's tight money situation, there are fewer construction projects and dive job possibilities in this area simply because there is no construction in progress.

Research and development money, again from various government agencies, is tighter than ever and will proba-

(Continued on Page 32)



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Over the past 30 years, much of California's prime beach property has been sold for private residential or commercial developments. At one time it seemed this was to be the fate of Scotchman's Cove — until the State of California came to the rescue to the tune of \$32.6 million. After many years of uncertainty, divers will be assured of continued access to one of Orange County's finest beach diving areas, soon to be part of the new Crystal Cove State Park.

Scotchman's Cove has something for all divers. Instructors take advantage of the easy entry and shallow water for check-out dives. Skin divers pursue calico bass in the kelp beds. Divers with boats (or those who like long swims) hit the outside reefs for lobsters, anchors, or photographs. Others come just to picnic on the beach or to surf the shore break. Despite many years of diving pressure one can still find game, spectacular reefs, kelp beds, and even an airplane wreck.

The future state park is a pastoral oasis amid the suburban sprawl of the Southern California coast. Driving southeast on Pacific Coast Highway, you leave Corona del Mar and suddenly step back 100 years in time. On the left are rolling meadows and canyons, roamed by range cattle, covered with wild mustard and sage. To the right are the coastal bluffs and the waters of the Pacific Ocean, dotted with sailboats. The five mile drive over gently rolling hills, paced by joggers, ends abruptly at the city limits of Laguna Beach.

The entrance to Scotchman's Cove comes just before your return to the 20th century, on top of a bluff one mile northwest of Laguna. At first glance it doesn't seem like much of a dive site. An attendant collects parking fees at a ramshackle gate in the barbed wire fence surrounding the property. The bluff has been turned into an improvised parking lot with vehicles of all descriptions parked in the dirt. Vans, campers, and small pickups seem to predominate. A half dozen green fiberglass outhouses provide creature comforts.

You put on your wetsuit and tank in the dust, wondering if someone has given you a bum steer. That impression is reinforced as you trudge down the steep dirt path leading to the beach, already dreading the return trip. The beach doesn't look much better. Compared to the pristine beaches of Newport and Laguna, this one has more than its share of trash, dead kelp, and the remains of long dead camp fires. Beachgoers are allowed to bring dogs, and they too leave reminders of their passing.

A look at the water changes the first impression. To the south, surfers ride the waves below Abalone Point. The beach in front of you has a gentle shore break, the wave action dampened by the kelp bed 75 yards from shore. To the north, several rocky outcroppings convey a hint of the many reefs lying below the surface. A large rock, Scotchman's Reef, breaks the surface in the middle of the cove. A vast kelp bed parallels the beach 75 to about 200 yards offshore. The winter storms of 1979-80 destroyed some of the kelp, but it always comes back.

Underwater visibility is usually best in the autumn, when visibility in excess of 30 feet is not uncommon. In the spring and summer, visibility averages 15 feet because of plankton blooms. Generally, the Laguna Beach area, including Scotchman's Cove, offers the best visibility on the Orange County coast.

The best diving is found outside the kelp bed toward the middle of the cove. This requires a long swim of about 500 yards, but the reefs are worth it. Starting in 50 to 60 feet of water with about 30 feet of vertical relief, the reefs are richly covered with gorgonians, corynactis, sponges and hydroids. The presence of many rock scallops indicates the absence of divers, usually quick to denude reefs of anything that doesn't move. Lobsters can be seen looking out of the many holes and crevices in the rocks, although the vast majority are shorts.

The area is heavily trapped by commercial fishermen dur-

ing lobster season, but a night dive usually brings a lot of action, if not a lot of legal bugs. A particularly memorable one occurred last fall.

We were diving from our boat on a warm November night. The bugs were crawling around in the open in numbers one hardly sees anymore. Most of them were just barely short, but close enough to be worth grabbing and measuring. During the course of the dive I must have grabbed around a dozen of the creatures, but had only one legal one to show for my efforts.

I was down to 700 pounds of air when my buddy, Mike Curtis, pointed excitedly to a reef below us. We couldn't believe our eyes — there were over 100 lobsters, and all of them were sitting motionless on top of the reef. Most were short, but we began grabbing the larger ones in an ecstasy born of greed. Bugs were flying all over the place, hitting us in the mask and chest. By this time I was sucking on the dregs of my tank, so I let Mike know I was nearly out of air and reached for his octopus regulator. Mike, however, gripped his octopus firmly and swam off.

I surfaced and waited for Mike. When he finally came up I sputtered, "(Expletive deleted.) Why didn't you let me use that regulator?"

Calmly, he replied, "I wasn't about to let you grab *my* bugs with *my* air."

So much for friendship!

In addition to lobster, the outside reefs have lots of sand bass, sheephead, and a few calico bass. Spider crabs, bat rays, and large red telia anemones can be found in the sand. It is a popular sportfishing area, so many anchors are left behind

# Scotchman's Cove

## California's newest state park preserves dive spots

Text and Photography by Eric Hanauer

to be salvaged by divers. (Anchors are considered salvageable only when no longer attached to boats.)

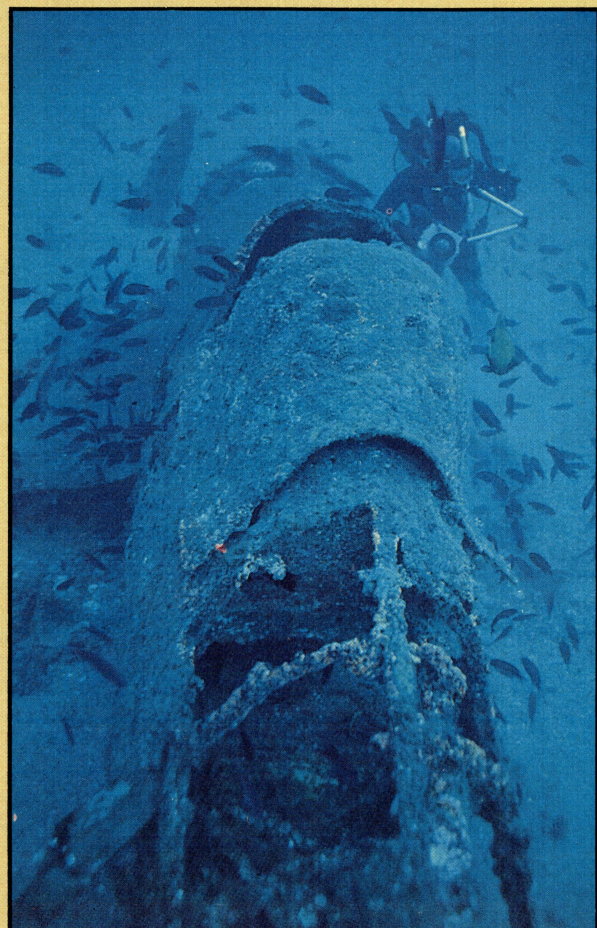
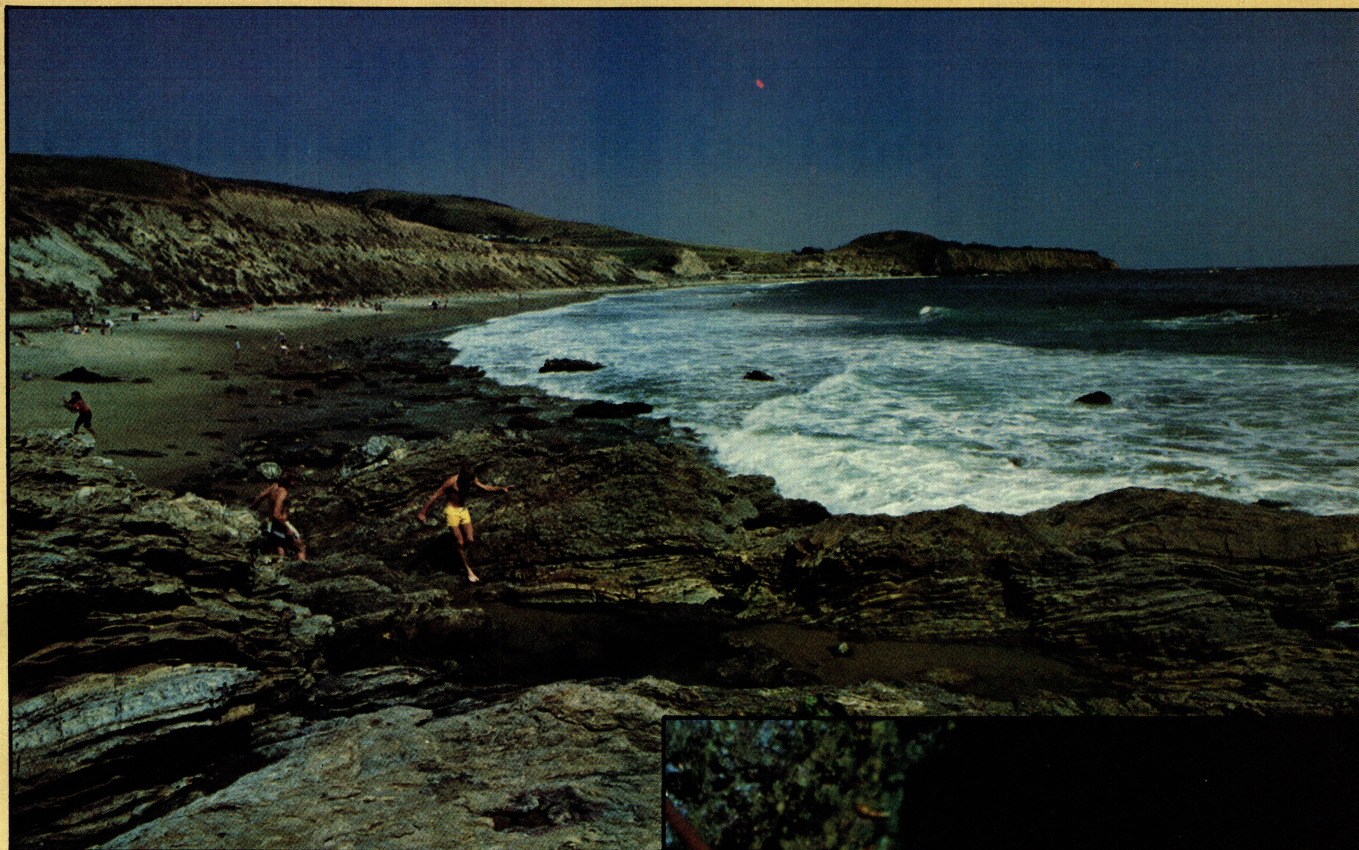
The remains of a World War II Corsair fighter plane lie in 70 feet of water, about one-half mile offshore. Over the years it had been discovered by several small groups of divers who kept the location a secret and attempted to preserve the wreck by not allowing anyone to take artifacts from it. The story of the Corsair appeared in the December, 1977 issue of SKIN DIVER (Laguna's Secret Plane Wreck).

Shortly after the story appeared, I received a call from Lt. Commander Tommy Thompson, USN (Ret). Tommy, one of the pioneers in Southern California dive circles, was involved in a salvage project on the wreck back in 1962. He filled me in on the history of the crash.

Two marines from El Toro Air Base were diving at Scotchman's Cove when they came upon the airplane. They reported the incident to their commanding officer, describing the wreck as containing guns, a parachute, and perhaps a body. Tommy

(Continued on Page 28)





Scotchman's Cove, just north of Laguna Beach, has something for every diver. Free divers pursue calico bass, boat divers search the outside reefs for lobsters, anchor salvaging or underwater photography. It is also a perfect setting for an apres-dive picnic. Surfers too are accommodated, they can surf the shore break.



**A**pproaching Jacob's Well from the east, we passed through the beautiful hill country of Central Texas. The 40 minute ride from Austin took us through Dripping Springs and ten or so miles beyond. Soon the huge sign advertising the Woodcreek Hillcountry Resort filled the sky. This large land development once encompassed a lot of the land surrounding Wimberly, the closest town to Jacob's Well. In the heart of this development (now defunct) lies the clearest dive spot in Texas, the well.

During the summer months, the well is congested with swimmers and tourists enjoying the beautiful landscape surrounding it. During the chilly winter months, however, only scuba divers and an occasional prospective land speculator enjoy the cave.

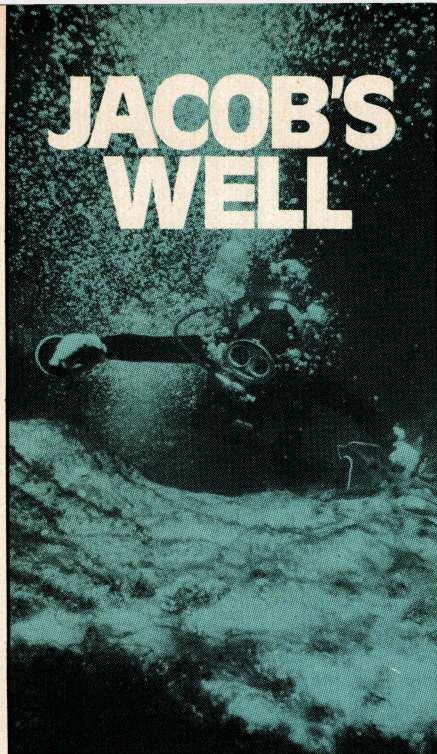
On the chilly November morning our dive group emptied out of the shop's van, no one else was in sight. I took a walk down to the cave to get my first look at this infamous dive spot. From the concrete wall that surrounds the well, I peered straight into the first vertical shaft and saw a large crayfish crawling along the bottom 30 feet below. The water was so clear it appeared colorless, so I kept my distance from the edge of the wall for fear of falling straight down to the rock bottom.

Jacob's Well is one of the many openings where the cool, clear water of the Edwards's Aquifer escapes to the surface from the deep caverns below. The water flowing from Jacob's Well is a constant 68°F year-round. After severe rains on the Edwards Plateau, the gentle flow from the cave can change into a frightening current that makes diving all but impossible. The usually gentle flow in the spring eliminates one of the inherent dangers of cave diving: Silt. Only after severe droughts, when the water flow almost stops, does silting become a problem.

Despite the absence of silt, most dive groups dive without fins on. This tradition was started by Don Brod, an Austin dive shop operator. Leaving swim fins on the surface was initiated because of the large number of buddy teams that file into the cave. Not only do the divers enjoy the free falling sensation, but what little silt there is in the cave never gets kicked up.

When you slip into the cool, clear water, the flow feels much stronger than it appears because there is no boil on the surface. The basic structure of the cave is vertical. The round shaft measures about 12 feet around. Its walls have long been smoothed over by the constant outflow of water funneling up into this first section. On the west wall small fish dart in and out of some moss growth swaying in the flow.

From the bottom, I take a few steps under a small ledge and see the shaft which leads to the second room of the



## the clearest dive in central Texas

Text and photography  
by O.C. Garza

cave. The yellow safety line contrasts sharply with the black walls of the second shaft. I descend a few feet and spot a small opening in the wall. As I shine my light into it, I catch a slow flashing movement at the end of this small opening. I see the object stop and look at me; finally realizing it is a large catfish whose massive head fills the width of his home. As I shine my light upward into the opening, I see the trash of previous divers embedded in a small crack; imploded flashbulbs and the lens assembly of a dive light litter the roof of the catfish's dwelling. Following the safety line into the second room, I stop to see the sunlight filtering down into this rectangular chamber. The chamber measures about 10 feet wide and 12 feet long. At one end, a large stalactite-shaped rock hangs down from the ceiling. The pointed rock is wedged between two smaller rocks, giving the impression that it is suspended by the will of God rather than a physical support. Putting a short burst of air in my BC, I make an effortless step up to the large rock. Shining my light above, I see a family of juvenile catfish scurrying for the shelter of darkness. Holding my console as high as possible, I see that the rock begins in 37 feet of water and when I settle on the floor of the second room, my gauge reads 55 feet. It looks much closer

than it measures because of the clear water. I point my light at my buddy who is watching a crayfish fight off a school of brim eager for an early morning snack. Nearby, other crayfish wander along the floor of the cave unmolested by the wolf-pack of small fish who continue their quest for food.

By shaking my dive light at my buddy, I get his attention and motion for him to look into an opening which is just above the entrance to the third and final chamber. Gracefully, I ascend to the opening and land on a small foothold. This cutout is much larger than the one inhabited by the catfish. My buddy and I enter the opening and are dazzled by the large number of fossils embedded in the walls. As I look up, I see a small opening which stretches from this cutout all the way to the smaller opening above; I can even see the large catfish above investigating our bubbles. The cutout only extends about ten feet so my buddy and I make our exit to explore the next chamber. As I turn to make sure my buddy is behind me, I notice the spotlight effect my light gives off as it shines on my dive partner. In water this clear, the only limit to unlimited visibility is the penetrating power of the dive lights.

Dropping back into the second room, I signal to my partner that I'm ready to enter the third chamber. My buddy merely shrugs his shoulders signifying, "What?" I realize I made a mistake for which I was cautioned against on the surface: Whenever signaling to a buddy in a cave, or on any night dive, be sure to perform the signal in front of your light, not next to it! Finally getting my message across, we enter the third and final chamber.

As we slip under the entranceway, I feel the concentrated rush of water penetrate my wetsuit, robbing me of much needed warmth. The entranceway is shaped like an arch which seems to invite divers to explore the last room and admire nature's finished work. The last room does take on the appearance of a rock sculpture, a product of centuries of erosion. The walls change from the light brown of the second room into rich, textured browns decorated with fossils and outcroppings. The arch leads into a sloping tunnel which begins to narrow at 60 feet and it runs into a grate at 75 feet. This steel and concrete grate was installed by local divers and PADI instructor Don Dibble. Before it was installed, many divers were lured past the boulder at 75 feet — some to their deaths. The grate will prevent future fatalities and injuries.

The flickering action of my buddy's light brings me back to the present. He signals for me to turn off my light as he switches his off. The brown, textured walls darken into a vacuum of black. Everyone has dived in lakes and oceans where the visibility has been zero, but this vacuum of darkness, blacker than



the darkest shade of night, is not to be believed. My confidence in the on/off switch of my light is fading fast, but I know my back-up light will work if my main light fails. My thoughts turn to those who entered Jacob's Well with only one light. A single malfunction and a deadly situation comes to life. How do you locate the safety line in the dark? How do you find the way out in the dark? Which way is up?

Turning my light back on (it still works), I find a small boulder and seek shelter from the chilling flow. I can see more fossils embedded in these walls and even in the small rocks that cover the floor of this cave. Shining my light back toward the archway, I see graffiti etched in one wall of this last room by destructive divers. As I look toward my buddy, I watch as he observes another crayfish about six inches long. Catfish, crayfish and small minnows inhabit the cave. Occasionally a freshwater eel will come up from deep within the aquifer and cause a lot of excitement. The show is a temporary one as the eel continues its journey to the ocean to breed.

I signal my buddy that our down time is almost up and we should begin our ascent. Exiting under the arch, we enter the second room. I look up and can see the sunlight filtering into the large chamber. Gaining slight positive buoyancy, I begin gently rising toward the natural light above. I'm temporarily blinded by the intense sunlight which comes straight into the first section of the cave. The black, rough walls of the caverns below are replaced by the smooth walls of the vertical shaft. As I become reaccustomed to the sunlight, my thoughts turn back to the dry world above. Diving in the well detaches one from the complexities and turmoils of the world above. Yet, as I break the waterline and breathe the moist, natural air, I'm relieved to know the world above still survives, as do the inviting chambers of Jacob's Well below. 🐟

#### FURTHER INFORMATION

For information regarding the conditions of Jacob's Well, contact the following dive shops:

##### The Dive Shop

P.O. Box 2130  
San Marcos, TX 78666  
(512) 392-7440

##### Texas Scuba diving Schools

4320 North Lamar  
Austin, TX 78756  
(512) 453-7676

For information on cave diving:  
National Association for Cave Diving

P.O. Box 1518  
High Springs, FL 32643

National Speleological Society  
Cave Diving Section  
P.O. Box 60  
Williams, IN 47470



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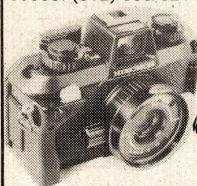
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## SCOTCHMAN'S COVE

(Continued from Page 25)

headed up the Navy's dive unit at the time, and was sent out to recover the engine so the incident could be traced through the identification numbers. A two day sonar search on a minesweeper was fruitless. On the third day, with the help of the two marines, they found the Corsair. It contained no guns or bodies, but the remains of a parachute were entangled in the wreckage.

After liberating a few lobsters and instruments, the Navy divers attached a cable to the engine and removed it with a salvage tug. A trace of the ID numbers revealed the plane had crashed in 1948 on a flight from Los Alamitos to San Diego. The pilot escaped with only a minor leg injury, although he had to be rescued by a surfer.

During California's record drought in the fall of 1977, visibility off the coast reached vintage proportions, with 40 feet the norm. One December day I was able to see the wreck from the surface, 70 feet below, and shot an entire roll of available light pictures. It was as though the ocean was giving us one final look at the wreck before she destroyed it.

The drought ended with a vengeance during the two months of storms which followed. When we returned to the Corsair in March, the fuselage from the wind-screen to the tail had been reduced to twisted wreckage, and was strewn over a 30 foot area. Apparently a fishing boat had fouled its anchor and pulled the plane apart while trying to retrieve it.

During the next few weeks we collected some of the instruments which had been scattered in the sand and would otherwise be lost forever. On a final day of salvage we stuck the propeller blade upright in the sand and moved some of the scattered wreckage back behind the cockpit with the aid of lift bags. Since that time very few dives have been made on the site. It is sad to see what's left of the old Corsair and remember it as it used to be.

Perhaps the biggest hazard in the deeper waters of Scotchman's Cove is the heavy boat traffic. Only four miles from the Newport Harbor entrance, it is a popular destination for private craft and for the half day sportfishing boats. A float with a divers flag is highly recommended here. In addition, we always save enough air on ascent so we can stay below the surface a little longer if a motor is heard overhead.

Spearfishing is best during the early morning hours, in the southeast end of the cove. Halibut come into the shallow sandy areas in spring and summer, while the kelp bed yields large calico bass to the skin diver. (The big ones are easily spooked by bubbles.)

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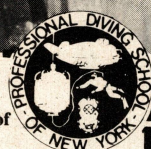
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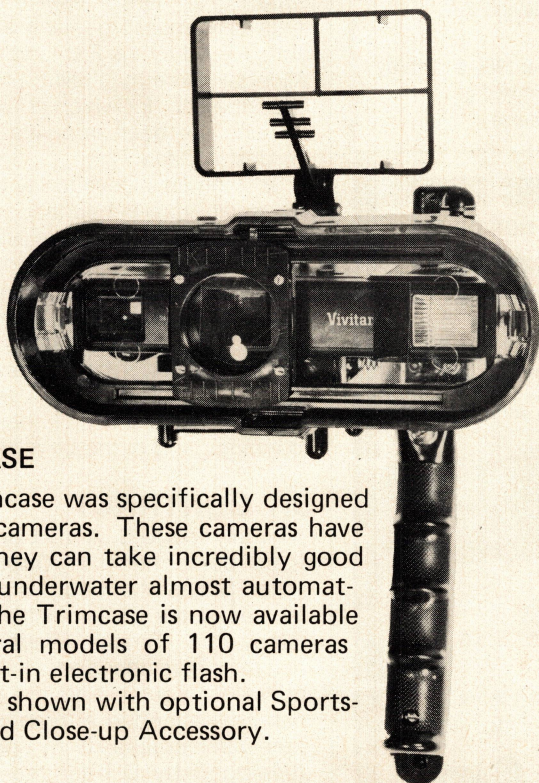
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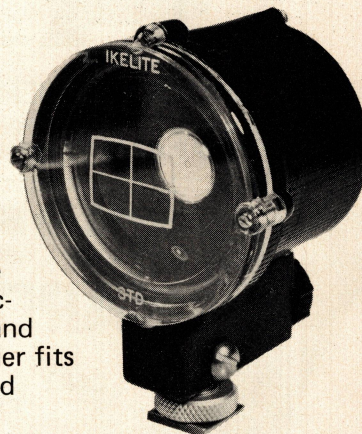


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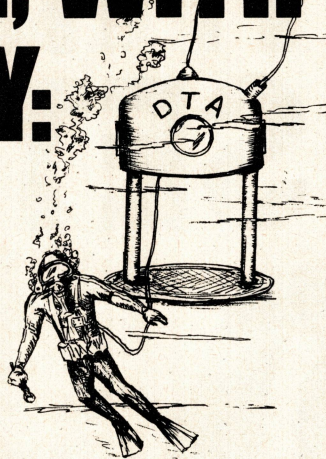


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## SCOTCHMAN'S COVE

In the old days the place was a lot more productive. A world record black sea bass, 481 pounds, was taken at Scotchman's Cove in 1961, and a 70 pound white sea bass was shot there two years later. Today, seeing a 20 pound sheep-head is cause for excitement.

In 1979 the Scotchman's Cove was acquired by the State of California as part of an 1892 acre land purchase. This includes the five miles of beaches and bluffs along Coast Highway from Corona del Mar to Laguna Beach, which will be developed into a new state park. Right now, a two year study is underway to formulate a general plan for the state park commission to ensure optimum use of the property. One of the objectives is to preserve and utilize the underwater resources, and input is welcomed from all interested parties.

Among the questions under consideration is whether to make the park an underwater preserve. At the present time it is part of a marine reserve, which protects all tidepool organisms and anything not covered by the Fish and Game laws. All legal game may still be taken — except abalone, for which a five year moratorium has been imposed from Palos Verdes to Dana Point.

Scotchman's Cove today doesn't look like much from the surface, and the old timers bemoan the days when access was limited to the knowledgeable few and game was plentiful. There are problems with trash pickup and supervision during this transition period. But future access has now been assured for all people, and eventually the topside view may approach the splendor of its surroundings and of the U/W world.

## DIT CONTRACT

Twenty-four U.S. Army Corps of Engineers personnel from throughout the United States attended two special dive courses at the Divers Institute of Technology, Inc., Seattle, Washington. Sixteen members attended a four week diving safety course and the other eight members attended a three week diving supervisor course. Both courses were developed by DIT for the U.S. Army Corps of Engineers, U.S. Army Engineer Division, Huntsville, Alabama.

The purpose of the Diving Safety Course was to provide corps employees who are assigned to diving activities the necessary knowledge, skills, techniques and methods to safely perform underwater tasks. The purpose of the Diving Supervisor Course was to provide corps supervisory personnel assigned to diving activities with the necessary knowledge, skills, and techniques to safely supervise U/W operations.



## MUSEUM EXTRAVAGANZA

"Exploring the Deep Frontier," the new museum show that takes visitors on a deep sea dive (without getting wet) opened December 19 at the California Academy of Sciences in San Francisco's Golden Gate Park. The exhibit is produced by the Academy of Sciences in cooperation with the National Geographic Society and is divided into six major sections.

At the entrance, "Water, Essence of Life," is the audio-visual prologue which reveals the magic of the sea with words, music and photographic images.

"Into the Depths," describes the reasons not to dive: lack of air, effects of pressure, cold navigation problems, dangerous sea creatures and illustrates the various methods from early to modern times that man has devised to master these problems.

A video program compares early diving devices with a recent solution to getting man into the water called the JIM suit. You will see Dr. Sylvia Earle walk on the bottom of the ocean off Hawaii at a depth of 1250 feet, the deepest walk ever accomplished by a woman.

The "Lure of the Sea" details why man dives: for food, treasure, exploration, natural resources, scientific study, military strategy, or simply for the sheer joy of diving. A video segment in this section features Dr. John McCosker, Director of San Francisco's Steinhart Aquarium as he dives at Dangerous Reef, Australia to study 17 foot great white sharks.

"Extending the Deep Horizon," describes the latest in technology to put man deeper with more freedom of movement into the depths. On film, visitors will follow underwater cinematographer, Al Giddings, National Geographic President, Gilbert Grosvenor, and diving physician, Dr. Joe MacInnis for a rare dive under the polar ice cap.

"Reaching the Limits," tells of some of the more than 50 undersea habitats that have been developed over the past 18 years to allow divers more than just a short time underwater. Also in this section is a film clip of man's deepest breath-hold dive executed by Jacques Mayol to a depth of 328 feet, and footage on experiments being conducted at Duke University by Dr. Peter Bennett on the effects of extended deep sea living.

The concluding section, "An Ocean Ethic," is a beautiful film produced by the Ocean Trust Foundation; a stunning ballet of underwater life set to the music of David O'Riordan.

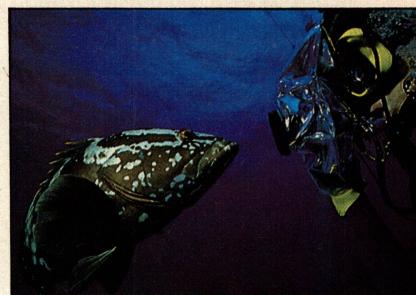
"Exploring the Deep Frontier," continues at the California Academy of Sciences through May 17. The exhibit, as well as the entire natural history museum complex, is open every day of the week from 10 until 5. Admission ranges from free to \$1 for adults and the first Wednesday of every month is free to all. ➤

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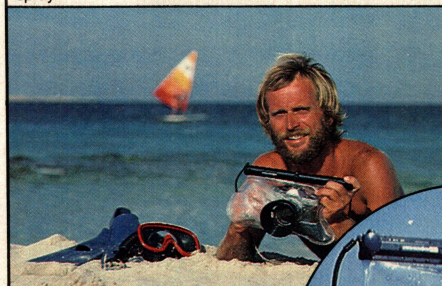
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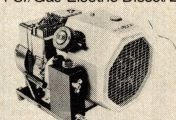
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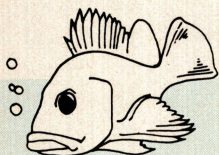
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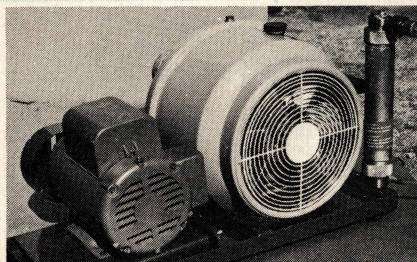
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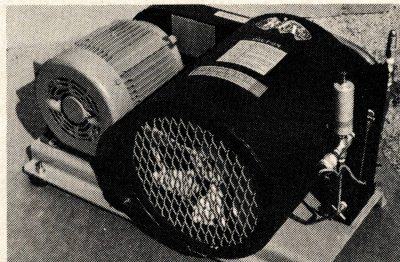
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## TECHNIFACTS

(Continued from Page 22)

bly remain tight for some years. As a result the demand for commercial divers in scientific diving is presently low.

The amount of salvage diving is also at a low point and, I feel, will continue to decline because of the development of technologies (radar, Loran, echo ranging devices, etc., that permit accurate navigation during the day or night) that help prevent shipping disasters.

The harvesting of marine products has been declining in recent years in some areas. Abalone harvesting was once a flourishing industry and employed many divers in California, Australia, Africa, Japan and, to a lesser extent, in other areas. Overfishing and pollution have somewhat depleted fishing stocks in this field. Probably other ocean crops that were once diver harvested have suffered similar pressures and have declined, at least in heavily fished areas. This is a field of diving, however, that offers an opportunity for the beginning diver and has, in fact, been the starting place for many of the most successful divers in the other dive industries today.

A study of the needs of dive industries in offshore oil, construction and salvage indicates a total work force of about 4500 active divers with perhaps 20,000 dive related support personnel. Most of the latter have had at least some dive training and many are qualified divers who have worked up through the ranks.

The annual rate of attrition in dive personnel through death, promotion, change of job classification, etc., is probably about 10 percent of this work force. This means that about 450 new dive jobs and 2000 support personnel jobs become available worldwide each year.

## DIVER UNIONS?

A reader asked whether a commercial diver acquires jobs through a union, or by personal interview. The answer is both. Construction divers in some areas *must* belong to the Operating Engineers. In other areas, to the Carpenters Union (Bridge, Dock, and Wharf Builders). In recent years I believe the offshore oil workers have become organized, including divers. In some fields of diving there are no union organizations. Commercial harvesting of ocean products and research diving are two such fields.

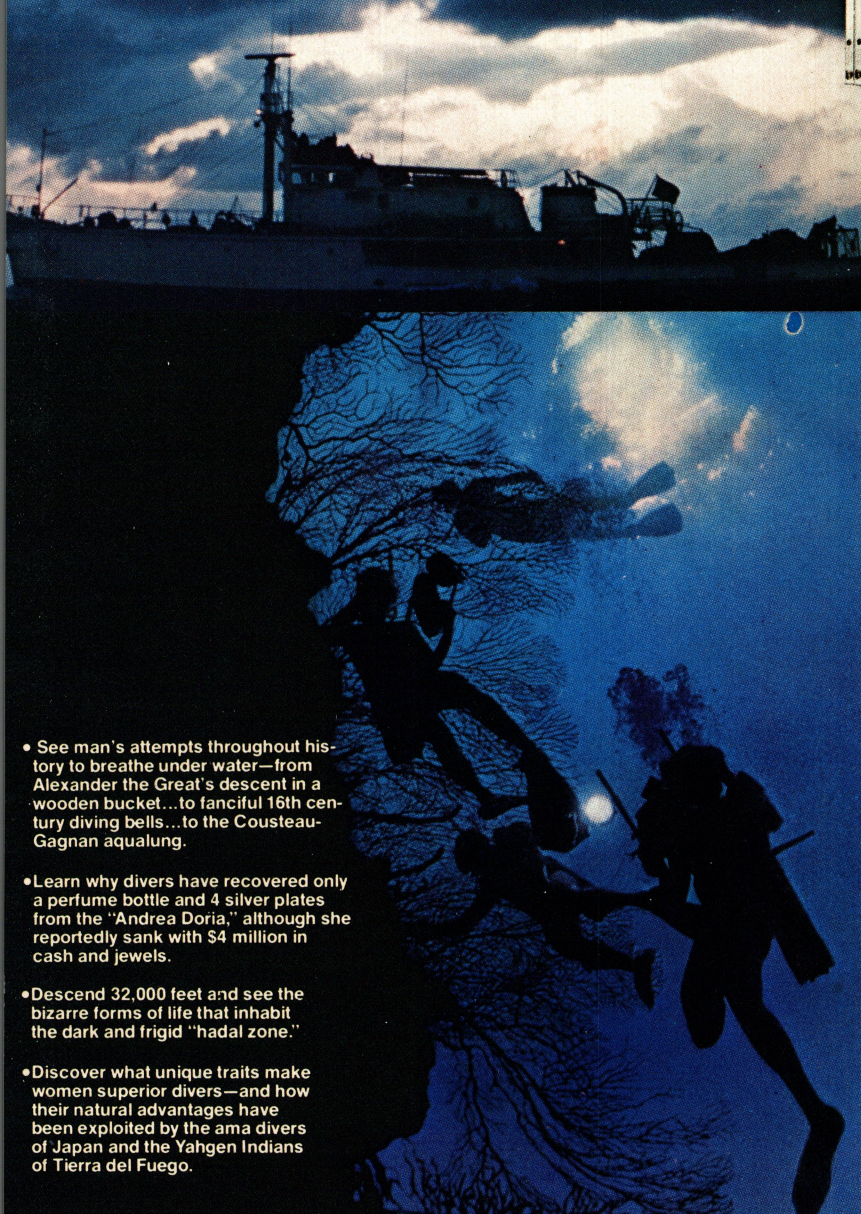
## CONTRACT OR STAFF EMPLOYMENT?

Another reader wanted to know if commercial divers are employed as staff members, or as independent contractors.

Again, the answer is both. Generally a diver is employed by a contractor for a



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## TECHNIFACTS

specific job that may take a week or as long as two or three years. This contractor may not get the bid for another job for many months and the diver must look elsewhere for work.

Some companies keep a diver employed, or under contract, full time. The diver works at other jobs until needed as a diver. Usually the diver is employed at a well paying trade and his diving enables him to earn even more money since he is paid extra as a diver.

The exception to the latter is when a diver is employed, or under contract, to provide services at a fixed salary or at a fixed rate. The important thing is that the person's qualifications as a diver are worth more to an employer, and so he/she is paid more.

Freelance divers who work for many contractors simply follow the jobs; working around the world as job availability and the demand for their services dictate.

Basically a diver works either as a part-time diver with a full time, well paying job, or as a migratory worker with a nearly full time position.

## COMPANY TRAINING

Are there companies willing to train a scuba diver in hardhat diving, a reader wondered? None that I know of, except the dive schools. A construction or salvage company is controlled by OSHA regulations with regard to what persons it may hire. To be eligible for employment, a diver must pass a strict physical examination, have a dive log proving he/she is qualified for that type of diving, and meet other strict OSHA regulations. Unless the diver can meet those regulations he/she cannot be employed. This makes it impossible for a company to employ a person for on-the-job-training as a diver.

The above is also the reason most construction companies now contract with specialty dive companies for the services of their divers and for all support personnel and equipment. In a way this is good for divers since the dive company can keep its personnel employed, but the diver has to be willing to follow the jobs.

"What kind of response do you think I would get if I wrote to various companies regarding work as a diver?", another reader asked. None, for the same reason as outlined above. Companies simply cannot hire unknowns; and they are busy. Therefore, there are likely to be no replies to job questionnaires.

## SHARED TIP

Commercial diver H. Rancher, Amarillo, TX, shares the following thoughts with other divers. "For light salvage work use



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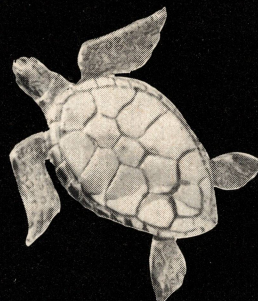
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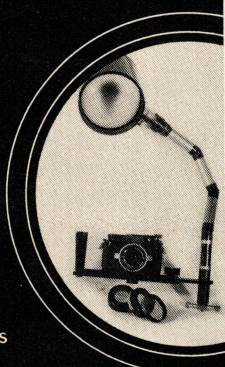
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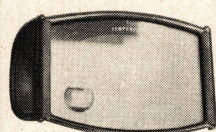
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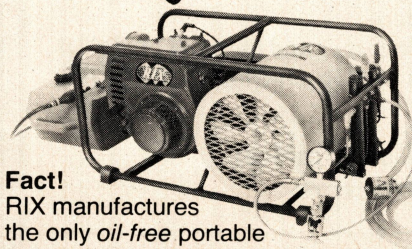
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My thought on the above is that this float is probably suitable for work in rivers, lakes, and other calm waters. Such a float would not hold together in open sea or rough water conditions. But the idea of using the styrofoam planks for flotation for a work platform is good. Thanks for sharing.

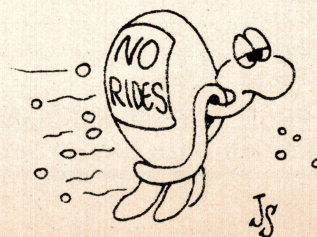
For their questions and comments used in this month's Technifacts I would like to thank the following: Thomas J. Page, Jalisco, Mexico; H. Rancher, Amarillo, TX; Stephen J. Furlong, Rockville, MD; Michael Knoll, Kealahou, HI; Wayne Adams, Martinez, GA; and James L. Story, Homestead, FL.

Several readers have written requesting more information on recovery of underwater objects. More information will be provided on this in next month's Technifacts.

## SALVAGE DIVING BOOKS

Sport divers sometimes become involved with commercial diving as a result of receiving requests for their services in connection with the salvage of small objects such as sunken boats, cars, airplanes, lost outboards, tools, etc. Occasionally a group of experienced sport divers may attempt salvage of larger items such as ships or cargoes. Also they may want to form a company to perform these services.

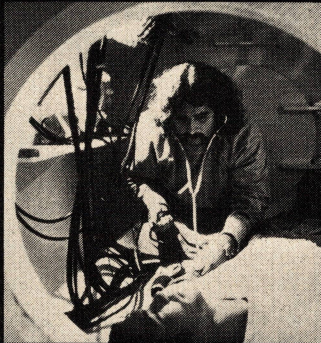
Requests have been received from interested sport divers for a list of books dealing with both light salvage and more advanced work involving complex skills and equipment usually beyond the scope of the sport diver. A complete list of such books with their contents would be quite lengthy and of limited interest. However, if readers interested in salvage diving will send a stamped, self-addressed envelope to Technifacts, SKIN DIVER Magazine, 8490 Sunset Blvd., Los Angeles, CA 90069, a list of books, including a brief outline of their contents, will be sent.



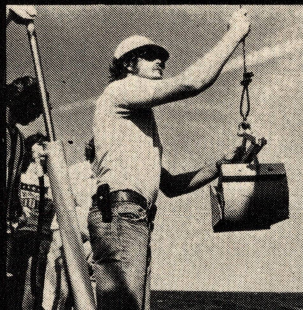
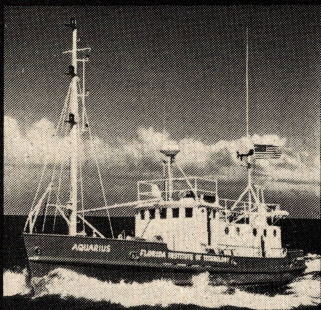
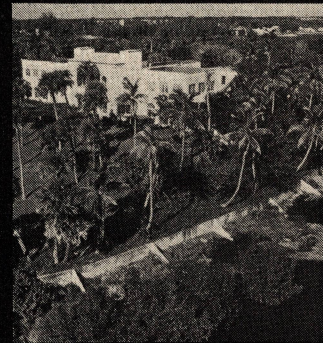


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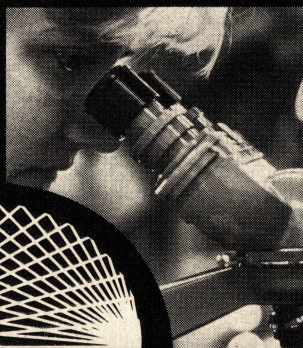
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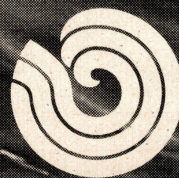
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**I**t was 1967. Fired by the search for North Sea oil and gas, British scuba divers like myself were seizing the chance to turn professional in hopes of cashing in on the anticipated bonanza. Few, however, were having much luck. Dive contractors tended to look down their noses at scuba divers, whom they considered unreliable bubble blowers. It was clear that, unless you were used to dragging a hose, you were of no use to industrial diving. The obvious answer was to enroll in a commercial course.

That, however, was easier said than done. After a week of inquiries, I located only two courses: one on the south coast run by two old salts; the second at a flooded quarry organized by an American dive company. The former consisted of a week of what was little more than blind man's bluff on the sea bed, and the latter was not open to the public. Thinking that there must be alternatives, I called a manufacturer of commercial dive equipment.

To my surprise, it turned out that they had a dive school on the premises — indeed, as the lady on the other end informed me, it had been operating for years. If I wanted, I could start the following week.

The course was exclusively devoted to hardhat diving and covered the basics in the incredibly optimistic period of three weeks. The first week was devoted to the use of the gear itself; the second to underwater cutting, and the third to underwater welding. Theory was kept to a minimum.

The equipment was as cumbersome as medieval armor: the Admiralty six-bolt helmet, equipped with separate air-pipe and breast-rope, weighed 60 pounds; weights, slung on the diver's chest and back, accounted for 80 more pounds and brass-capped, lead-soled shoes, weighing 18 pounds apiece, kept the diver on his feet. To discourage sea monsters, a large knife in a heavy brass scabbard was carried at the waist.

During the first week we worked in an enormous 12 foot deep tank. For hours at a time we sawed up old furniture; filed and chiseled hunks of metal and punched holes in blocks of wood. Our tools were so blunt that results were achieved only by protracted effort. From time-to-time, the chief instructor would peer into the tank to check on our progress. Usually — and not surprisingly — it was minimal. The Chief — as he insisted on being addressed — was a product of countless years in the Royal Navy and, in true military fashion, derived immense satisfaction from watching people expend enormous energy on totally unproductive projects. It was part of his philosophy that one learned

## AND DO YOU PLAY TIDDLY-WINKS TOO?

By Christopher Swann

best by being made to do things the hard way. Had there been a lawn at the bottom of the tank he would have provided us with scissors rather than a mower.

On one occasion, in the midst of destroying a rickety chair, I paused for a moment to rest. My dive companion — a soldier on special leave from his regiment — had evidently become bored with his never-ending task. He inflated his dress and jumped onto the workbench: First he sat, then he lay down, then he rose to his feet and bounced up and down, his lead soles clanging on the metal table. Soon he became bolder; he tried standing on his head. At first he fell back, crumpling in an ungraceful mass of lead and copper; then, all of a sudden, he was upside down — a loop of his hose snagged the vise — and he shot up to the surface, taking the bench with him. It was a most impressive sight: He was floating upside down, the workbench hanging from his hose, with my half-mutilated chair still in the vise. I was admiring this extraordinary scene when the Chief's voice came roaring over the phones: "Get 'im un'ooked — the stupid bugger — get 'im un'ooked!"

It was with some difficulty that I extricated the unruly soldier, sending the workbench crashing to the bottom of the tank. Back on the surface, the Chief treated us to a colorful discourse on his opinion of Army discipline.

One exercise the Chief set great store by was searching for objects while blacked-out to simulate zero visibility. It appeared that much of the Chief's dive career had been spent at the bottom of Portsmouth harbor, which he assured us was "blacker than black." He would often lament that he was unable to stick us under five feet of soft mud; clanging about the tank was a poor substitute.



At the beginning of the session a large number of small metal objects were thrown into the tank; then two blacked-out divers were set to work looking for them. When an item was found, it had to be correctly identified by feel before being crossed off the list. On all-fours, waving their arms like lobster antennae, the divers would often crash into each other with a metallic thud. Three hours of this was generally enough to produce the diving equivalent of housemaid's knee.

Underwater cutting came as a welcome relief. We now moved to a small rectangular tank, so cramped that there was barely room for one diver and a bench. At the end of each day the tank had to be drained and the slag and metal scraps shoveled out.

Before we began cutting underwater, we spent a day practicing on the surface. The Chief, who always wore a suit, put on his coveralls and gave a brief demonstration; then he turned it over to us. It was much harder than we had expected. We set fire to practically everything within reach, but succeeded in cutting remarkably little metal: One overzealous student even burned the seat out of my coveralls.

The next morning we were back underwater, attempting to use the oxy-hydrogen torch: An infernal instrument that was lit on the surface and then lowered to the diver; whereupon it promptly went out. The Chief would then appear

(Continued on Page 114)



# the rules of composition



Above, triangles add strength to composition. Below, bright colors add interest to your photographs.

Text and Photography by Jim and Cathy Church

The purpose of this article is to help you apply some basic rules of photographic composition to your underwater photography. We will assume that you have already been taking underwater pictures, and will concentrate on the creative rather than the mechanical aspects.

## HAVE A SUBJECT

Good pictures usually have a strong primary subject. You may include one or more secondary subjects in the picture, but the purpose of the secondary subjects should be to support the primary subject without distracting the viewer's attention. If the viewer's eye must search the picture — up and down, and from side-to-side — to find your primary subject, he will soon lose interest.

The primary subject, however, doesn't necessarily need to be a single object. A school of fish, cluster of featherduster worms or a pattern of kelp fronds may be the subject. Likewise, secondary subjects may consist of several objects in the distant background, such as a school of fish, group of divers or coral formations. The key point is this: The viewer must see something that he identifies as the subject, even if he can't name or otherwise identify it.

## PLACE INTEREST OFF-CENTER

Your pictures are often more interesting when you place the main points of interest off-center. A point of interest is a point within the picture which attracts the viewer's eye, and this may be just a part of your primary or secondary subject. Points of interest are those subject areas which are the most sharply focused, the most colorful and the brightest. And if the subject has eyes, they will be a main point of interest. A fish may be centered in your picture, but it is the off-center eye of the fish that is the most important point of interest. Or, an anemone may be exactly centered in your picture, but the circular pattern of its bright tentacles draws your eye away from the center.

## THE RULE OF THIRDS

The rule of thirds will help you place your points of interest away from center. It works like this: When composing through the viewfinder, mentally divide the picture area into thirds — vertically with two lines and horizontally with two lines. These imaginary lines will cross at four points, which are called the intersections of thirds.

Compose so points of interest are located near these intersections of thirds. The subject may be perfectly centered in the picture, but the points of interest — the eyes, tentacles, and the bright colorful areas — are what we want away from the center.

Placing the main subject at one intersection, and a secondary subject at the





Photographs are often more interesting when you place the main points of interest off-center. The anemone is exactly centered in the picture, but the circular pattern of its tentacles draws your eye away from the center.

diagonally opposite intersection, is an effective technique. A photo with a diver in the upper left looking down at a fish in the lower right, for example, will probably be more interesting than a photo with both the diver and fish at the same level.

### WORKING WITH ANGLES

Placing your subjects at angles is another application of the rule of thirds. For example, if you are taking an extension tube shot of a tiny flamingo tongue, which is vertically aligned with a coral stalk, tilt your camera. This will place the flamingo tongue at an angle — leading from one intersection of thirds to another — in your picture.

With larger subjects, tilting the camera may not be feasible; especially if there is a horizon line, bubble stream or other feature which will become a distraction. Therefore, pose your model at an angle.

Cathy instinctively aligns herself with the background and other subjects when posing. If there is implied action or motion in the picture, align your model at an angle which directs the viewer's eye toward that action or motion. Fish, of course, aren't always cooperative. Aligning the fish properly is usually a matter of patience. You stay in one place and wait (or hope), and maybe the fish will swim where you want it to go.

Angles which form triangles strengthen composition by leading the viewer's eye from one intersection to another. And triangles which form pyramids can provide a base for the picture so that it doesn't appear to be top-heavy.

### OVALS AND CURVES

Oval-shaped subjects are naturally well composed. Even when placed in the exact center of the picture, an oval out-

line leads your eye around the four intersections of thirds. This is why portraits of French and gray angelfish are so popular with Caribbean photographers. Their graceful, oval shapes lead to pleasing pictures. And for other examples, think of the spiny outline of an expanded puffer fish, or the tentacles of an anemone. Again, your eye is led around the intersections of thirds.

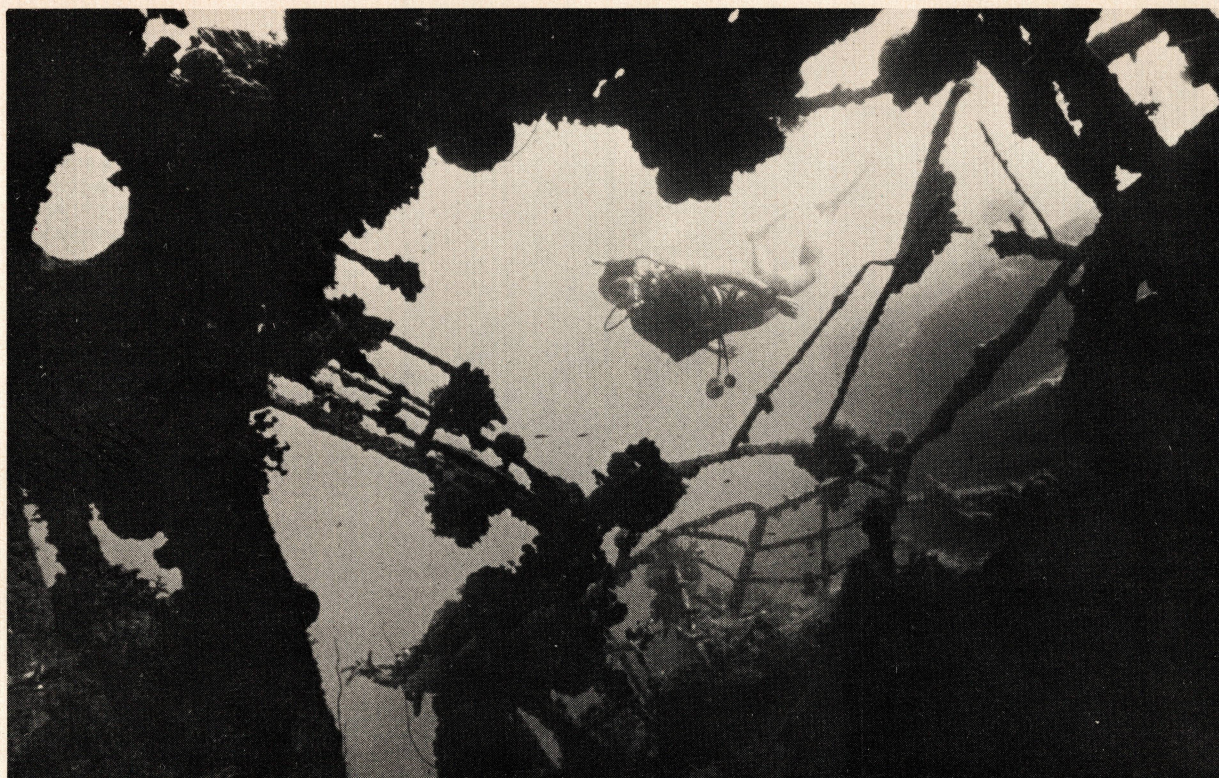
Curves are just partial ovals and can also add grace to your pictures. The curve of an inquisitive fish's body as it turns to inspect a diver, a curved frond of kelp, or the curved patterns of red finger sponges on an undersea wall are typical examples. Secondary subjects, with curved shapes, can be used to lead the viewer's eye to the primary subject. Try framing diver portraits and silhouettes with the curve of a near finger sponge, cave or tunnel openings, or undersea wreckage.



Interaction between marine creatures creates interest. Framing a diver with curved patterns adds grace to your photo.







When composing your pictures, look at both the vertical and horizontal format. Use upward camera angles to silhouette forms and shapes.

### EYE CONTACT IS IMPORTANT

When you view a portrait, you instinctively look for the subject's eyes. If a fish appears to be looking at you from his setting in the picture, it can give you a pleasant feeling. And even if the fish isn't looking at you, you still tend to seek out the eye.

Eye contact is also important in your diver portraits, but can be tricky. The basic rule is, don't look at the camera. This rule is most important if the diver will be a stranger to the viewer. Having a stranger stare at you can make you feel uncomfortable, even if just from a picture. You are no longer observing the diver — it is you who are being scrutinized. But if the diver is someone you know and like, the rule changes quickly: Eye contact with a friend can give you a pleasant feeling.

If the diver is obviously looking at something in the picture, your eye will instinctively look for that subject. And if the diver is staring at something that is outside the subject area — something that you can't see — the picture may not be comfortable to view.

To solve your eye contact problems with divers, give them something to look at in the picture. Looking at a fish, anemone, another diver, or over your shoulder will help. In action shots, however, the action that the diver is performing can overpower the need for eye contact. And in upward silhouette shots, where the diver is shown dark against a light background, eye contact isn't needed.

### SUBJECT AND PREDICATE

Think of a picture which shows action as if it were a sentence with a subject and a predicate that expresses a complete thought. Your model is the subject; your model's action is the predicate. Suppose, for example, that you are photographing another underwater photographer as she takes a portrait of a friendly grouper. She is the subject, and her action of photographing the grouper is the predicate. Your sentence is complete.

Let's make a change in the example: Suppose that your model has her eye hidden behind the viewfinder, and that the grouper is out of your picture area. Your picture will be uncomfortable to view because it is now incomplete. In fact, you don't even have a good portrait because your model's eyes are hidden.

There is an important exception to the subject and predicate rule: Suppose that you used the picture of a photographer photographing an unseen subject (from the last example) as part of a slide show sequence showing the photographer working with the grouper. It could be preceded by a slide showing both the photographer and the grouper, and followed by a close-up of just the grouper. These three slides, together in sequence, complete the action.

### REPEATED PATTERNS

Repeated patterns — such as a simple close-up of the curved ridges of a brain coral — can lead to pleasing pictures. And if turbid water limits your choice of

subjects, an extreme close-up of the top of a starfish can provide different and colorful patterns. Many California photographers have taken exquisite pictures showing the patterns of kelp fronds and bulbs. And if fish are plentiful, the pattern of a school of fish can make a pleasing picture.

### ADDING THE DISTANT DIVER

Placing a diver in the distant background can add a feeling of depth to a picture and can also provide size perspective. You may have a focusing decision to make because your depth of field may be too shallow to include both near subjects and the distant diver.

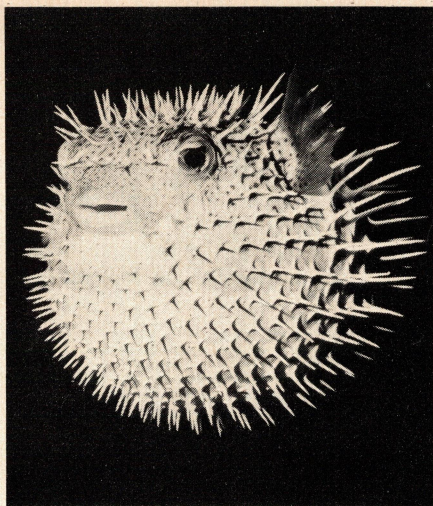
If the near subject — such as a fish, coral formation or possibly sunken wreckage — is the primary subject, and the diver is merely a secondary subject in the background, focus for the near subject. Having the diver slightly out of focus often improves the picture. If the distant diver is too close, and is partially in focus, the diver can draw too much attention away from your closer, primary subject. The viewer may be confused as to which is the primary subject.

If the distant diver — such as someone silhouetted in a tunnel opening, or against the ball of sun above — is the primary subject, focus for the diver. Allow the subject area in the foreground to go blurred. The foreground is only a frame for your diver subject.

### THE IMPACT OF INTEREST

Interest can overpower any rule of





Although the puffer fish is centered, the pattern of the spines draws your eye around the subject's body, away from the center of the picture.

composition. A shot of a shark biting your buddy, for example, has interest. It can violate the rule of thirds, have right to left eye travel, or even lousy eye contact, but it does have interest.

Or, for a diving biologist who is photographing a rare fish for the first time, the goal is a sharply-focused, well-exposed picture. This may not win any photo contests, but it might be sold to a textbook or filmstrip publisher. Some of the rules of composition may make the picture nicer to look at, but it is the interest of a rare subject that draws the viewers' attention.

During slide shows, we've seen audiences respond warmly to slides of divers working with eels — even slides that were poorly focused, exposed and composed — because they were interested in the action and narration. We've also seen audiences fail to respond to slides that mechanically followed the rules of composition, but which lacked the one vital ingredient — interest.

### THE IMPACT OF COLOR

Bright colors — especially yellow, red and blue — attract attention. Look back at your favorite underwater slides or prints — many of them are probably colorful close-ups. And for your diver portraits, having your model wear a red or blue wetsuit (or clothing in warmer water), a yellow scuba tank and other gear can brighten your pictures. For simplicity, a pair of gloves that match a bandana or bathing suit is an inexpensive way to add color.

Don't, however, lean on the crutch of color. We believe that some underwater photographers are so dependent on colors to create pictures that they overlook the other elements of composition. Developing a dependence on color, we believe, happens most often with underwater photographers who begin learning their new skills with an extension tube and flash unit.

### HORIZONTAL OR VERTICAL

The vertical 35mm format can be used to accentuate subjects with strong vertical lines. As examples, upward shots showing kelp stalks, walls, wreckage, or divers ascending or descending on the anchor line, lead the viewer's eye either upward or downward in the picture. Using a horizontal format, in many such situations, tends to block the viewer's normal eye travel. The vertical format, on the other hand, makes this eye travel easier.

When composing your pictures, look at both the vertical and horizontal format through the viewfinder. And if shooting up, where there is no strong horizon, turn the camera throughout the entire 90 degree arc from horizontal to vertical as you look for the best composition.

### WORK CLOSE

When you are composing through the viewfinder, move in close to your subject until anything that doesn't add to your picture has been eliminated. Working close, of course, is relative to your subject and the purpose of the picture. For a starfish portrait, working close can mean a matter of inches. But if your subject is a group of three or four divers, working close may mean several feet with a wide-angle lens.

In addition to improving your composition by filling the picture area with your subject, working close provides some mechanical advantages as well: First, the closer the camera to the subject, the fewer the suspended particles between camera and subject. Thus, the closer you work the sharper your images on film. Second, the shorter the total light path from strobe to subject, and back from subject to the camera, the better the color.

### EYE TRAVEL

Well composed pictures often lead the viewer's eye from left to right — the direction our eyes travel when reading. To illustrate this to yourself, look at several of your favorite pictures, and see how many of them tend to draw your eye from left to right. Then, hold these same pictures up to a mirror — to reverse the direction of your eye travel — and see how the pictures lose their impact.

Left-to-right eye travel, however, is not the same as left-to-right action or implied movement in the picture. Your diver or fish may be swimming or looking from right to left, but the viewer will usually be more comfortable if his eye travels from left to right.

If you wish to reverse the direction of eye travel in a slide, you can simply project it backward; if your projector has a flat-field lens and manual focus. But if you are using the curved-field lenses (which focus on the bulge of the slide)

## THREE BASIC RULES

There are three basic rules which can help you improve your natural light and flash fill underwater photography:

- 1) Get low.
- 2) Get close.
- 3) Use upward camera angles.

If you have trouble finding subjects, you may be swimming too high above the bottom. Small crevices, stalks and fronds of coral or weed, tube sponges and other formations and growths on the bottom may not appear to be potential subjects when you look down at them from several feet above. For example, here is a natural light shot of a group of tube sponges. Taken with a downward camera angle



and a 28mm lens, it's not a very exciting picture

Let's see if we can use the rules to improve this picture. First, we get low. We lie down in the gully and look upward at the sponges — we move around until we get the best angle. Second, we move in close until the sponges fill the vertical space in the viewfinder. Third, we use an upward camera angle to silhouette the sponges against the brighter surface and midwater background.

And as a final touch, we've added a diver to add interest and depth to the picture. The final picture isn't the greatest, but it certainly has been improved.







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## RULES OF COMPOSITION

and autofocus, a duplicate slide with the emulsion side reversed is best. In some of our close-up projection duplicates, the image is actually projected both upside down and backward to improve eye travel.

## CONCLUSION

Try to include one rule of composition in each picture you take, unless interest overpowers the rules. One of our past students used to write one or more rules, on masking tape attached to the back of his camera, before each photo dive. Later, he won a prize in an international underwater photography contest.

Don't be afraid to break a rule. The rule of thirds, for example, tells you to place your centers of interest off-center. But with some dynamic subjects, however, the picture may be better if the main point of interest is centered. Whenever rules conflict, go with the rule that seems to be strongest.

Also, keep in mind that people view pictures subjectively. One person may like a certain picture, another may not. In fact, you may disagree with some of the opinions and examples presented in this article. But this is why composition is so interesting — it is an art, not a mechanical science. »

## HOPCALITE

Carus Chemical Company, of LaSalle, Illinois, has announced the development of an improved form of hopcalite, a catalyst used to destroy ozone and convert carbon monoxide to carbon dioxide. Carus says that because of a unique manufacturing process, its proprietary hopcalite is harder, more abrasion resistant, more active and longer-lived than generic hopcalite.

The U.S. Navy is now studying the Carus product for use in submarines. Other applications are seen in gas masks, scuba tanks, foundry air pollution control equipment, and airliner ventilation systems. »

## STOLEN TAG

After 10 years, someone finally did it! Capt. Bob Klein reports his personal auto license plate was stolen last October. Anyone having information leading to the return of the 1980-1981 Florida tag, DIVE, will be rewarded with two free half-day dive trips aboard the 50 foot *Plus Ultra*. Capt. Klein is also offering a \$1000 reward for information leading to the return of a ten pound, pure silver weight-belt stolen last summer. Please direct any information pertaining to the above to Capt. Bob Klein, P.O. Box 1849, Key Largo, FL 33037. »



# SOME STORES ARE MORE INVOLVED

Yes, there are differences among dive stores. A few select diving retailers around the world are so seriously committed to the ideals of Scuba Training and Service that trends for the entire sport diving industry are the offspring of their innovations and standards. We have learned to recognize this rare dedication; now you can as well. Look for the mark of the 5 Star — emblem of excellence for the diving adventure.

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- Camarillo, CA 93010
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- 5 Cassotta Diving Inc. S-941
- 4930 Pacific Street
- Rocklin, CA 95677
- (916) 624-0611
- 5 Divers Den, Inc. S-944
- 22 Anacapa Street
- Santa Barbara, CA 93101
- (805) 963-8917

- 5 Mother Lode Dive Shop S-927
- 2020 H Street
- Sacramento, CA 95814
- (916) 446-4041

## CONNECTICUT

- 5 The Diving Bell S-021
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- Brookfield Plaza
- Brookfield, CT 06804
- (203) 775-3573
- 5 Innerspace Diving Supply S-016
- 598 Center Street
- Manchester, CT 06040
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- 5 Odyssey Diving Center S-822
- 2680 S. Havana Street
- Aurora, CO 80014
- (303) 751-4991

## FLORIDA

- 5 Divers Den South S-373
- 12614 N. Kendall Drive
- Miami, FL 33186
- (305) 595-2010
- 5 Divers Unlimited, Inc. S-301
- 4231 Hollywood Blvd
- Hollywood, FL 33021
- (305) 981-0156
- 5 Dixie Divers, Inc. S-3109
- 1717 South U.S. 1 (Bay No. 2)
- Ft. Pierce, FL 33450
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- Orlando, FL 32807
- (305) 273-3373
- 5 Lauderdale Diver S-378
- 1334 S.E. 17th Street
- Ft. Lauderdale, FL 33316
- (305) 467-2822
- 5 Prof. Diving Schools of Florida
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- Pompano Beach, FL 33062
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- Bahia Mar (A1A) S-3422
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- Boca Raton, FL 33432
- (305) 368-0555
- 5 Nautilus Dive, Surf & Ski S-3130
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- Pompano Beach, FL 33062
- (305) 943-3483
- 5 Nautilus Dive, Surf & Ski
- 2401 W. Oakland Park
- Ft. Lauderdale, FL 33311
- (305) 735-6227
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- Hwy. 21
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- (803) 524-7649
- 5 Ocean Sports S-397
- 129 Miracle Strip Pkwy SE
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- (904) 244-7681

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- 5 Berry Atlanta S-6104
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- Hapeville, GA 30354
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- Valdosta, GA 31601
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- Marietta, GA 30060
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## HAWAII

- 5 American Dive Hawaii, Inc.
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- (808) 732-2877

## ILLINOIS

- 5 Berry Scubatech S-6101
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- Alsip, IL 60658
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- 5 Berry Scuba Co. S-6102
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- Chicago, IL 60634
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- Indianapolis, IN 46268
- (317) 299-2522

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- 5 LaPorte's Skindiving Shop
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- (603) 763-5353

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- (505) 294-1886

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- Bellmore, NY 11710
- (516) 826-8888
- 5 Niagara Scuba Sports S-102
- 2048 Niagara Street
- Buffalo, NY 14207
- (716) 875-6528
- 5 Westchester Dive Center S-129
- 62-66 Westchester Avenue
- Port Chester, NY 10573
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## NORTH CAROLINA

- 5 Scuba World, Inc. S-229
- 4732 South Blvd.
- Charlotte, NC 28210
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- 5 Diver's Paradise S-436
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- 5 Treasure Cove Scuba S-425
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- Niles, OH 44446
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- 5 Oregon Diving School, Inc. S-9551
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## SOUTH CAROLINA

- 5 Buddy Line Divers S-234
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- 5 Underwater Works, Ltd. S-208
- 1023 Bush River Rd. Blvd. 7
- Boardwalk Plaza
- Columbia, SC 29210
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- 5 Wateree Diving School & Supply
- 4357 Jackson Blvd. S-231
- Columbia, SC 29205
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- 5 Currant Interprises, Inc. S-318
- P.O. Box 12323
- 600 Magnolia Avenue NE
- Knoxville, TN 37917
- (615) 522-6794

## TEXAS

- 5 Aqua-Trek, Inc. S-7261
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- Galveston, TX 77550
- (713) 763-0456
- 5 J. Rich Sports Ltd. S-704
- 420 Northcross Mall
- Austin, TX 78757
- (512) 451-5191
- 5 Southwest Scuba Divers S-709
- No. 16 Cielo Vista Center
- El Paso, TX 79925
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- 5 The Dive Shop S-701
- 4426 Ranch Rd. No. 12
- San Marcos, TX 78666
- (512) 392-7440

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## CANADA

- 5 Ozzie's Sports Centre, Ltd. S-N07
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- 5 Marianas Divers S-W02
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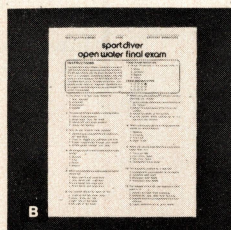
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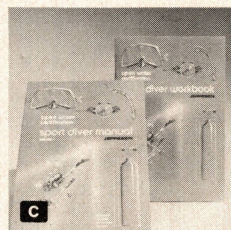
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**B. Final Exam for Open Water Course** Includes 100 multiple choice questions covering the information in the Jeppesen Sport Diver Open Water Manual.



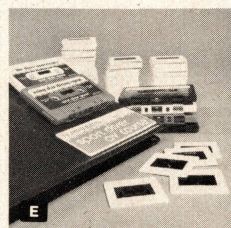
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**D. Deluxe Open Water Certification Student Kit** — Includes the Jeppesen Sport Diver Manual, Workbook, and 4-color diploma. The Manual has 285 pages consisting of 433 illustrations and photographs. Workbook contains 336 questions. Also includes Open Water Diver Logbook and 4-color No-Decompression Dive Table.



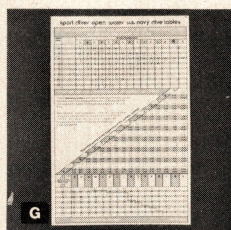
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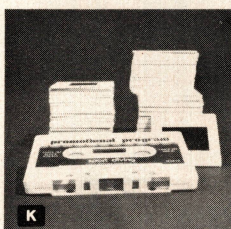
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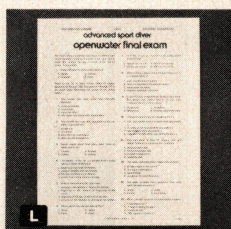
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## JEPPESSEN

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# SDM travel

## SECTION

**A** dramatic shift in color from aquamarine to deep blue was all we needed to know the natives were right. A glance at the depth gauge validated their claim, the wall off New Providence Island began in 35 feet of water.

As the coral studded floor beneath us vanished, my dive buddy and I hung weightless over the Tongue of the Ocean. Far below there was indeed a bottom. For now though, the sheer beauty of the near vertical wall held our attention as we drifted further away from the bustle of Nassau nightlife.

Until recently, few visitors to Nassau, New Providence in the Bahamas had the opportunity to visit the excellent drop-off sites located on the island's west and southwest shores. It was simply too far a boat ride from Nassau harbor. All that has changed.

Adjacent to the South Ocean Beach Hotel on western New Providence is the Omorka International Diving & Watersports Centre. A welcome newcomer to the Bahamas' most flourishing island, the center is only minutes away from some of the most outstanding dive sites in the Caribbean.

The white sand beach at South Ocean serves as the dive center's base of operation. Each morning you can almost set your watch as the *MV Omorka* heads out for the 9:30 dive. The 43 foot custom-built dive boat easily accommodates 20 scuba divers. Fifty aluminum 80's are recessed amidship, so divers have more room to suit up or stow their gear.

Today, Omorka divemaster Gene Blackmarr and Charmagne Haines select Chimney Wall as our first dive. Five minutes out from the dive center and we're already tossing the anchor. Gene, an Atlanta native, and Charmagne, a lifelong resident of New Providence, go over the dive plan. The siren call of wall diving must be respected and there will be no one pushing the tables today. But there's

no need to. Beginning in just 35 feet, divers can drop over the wall to 60 or 70 feet and still spend up to 45 minutes exploring the coral caverns and marine life which make up much of the drop-off.

Chimney Wall gets its name from an open ended tunnel which descends from the shallow depths and opens onto the wall at about 50 feet, providing a dramatic introduction to the infinite abyss below.

Various forms of marine life can be seen; a green sea turtle paddles by, headed for its brief breath of air at the surface; millions of tiny silvery fish seem to hang as curtains to the many crevices. Further along the wall a



## NASSAU'S SOUTH OCEAN BEACH

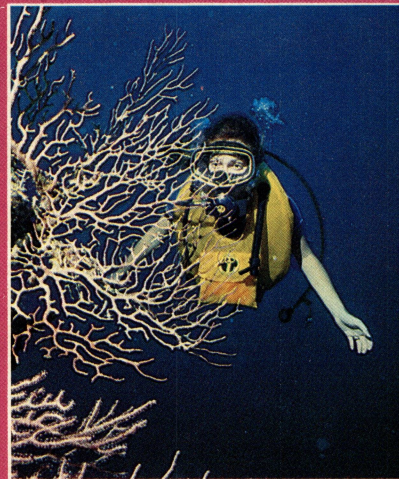
By Bill Mills

huge blue crab scurries into its home as divers approach.

We pause at 70 feet to check out some of the large gorgonians, purple sponges, and seafans adorning the wall. Above us, the sun peeks over the edge, silhouetting other divers as we follow our bubbles back to the waiting boat.

The second dive of the morning takes place at Goulding Cay. A short ride from most of the wall sites, Goulding is an underwater photographer's paradise. In just 30 to 40 feet of water lie some of the largest stands of elk-

horn coral to be found anywhere in the Bahamas. Subject matter ranges from curious Nassau groupers to tiny Christmas tree worms, just waiting to be framed by someone's macro tubes. The shallow depths at Gould-



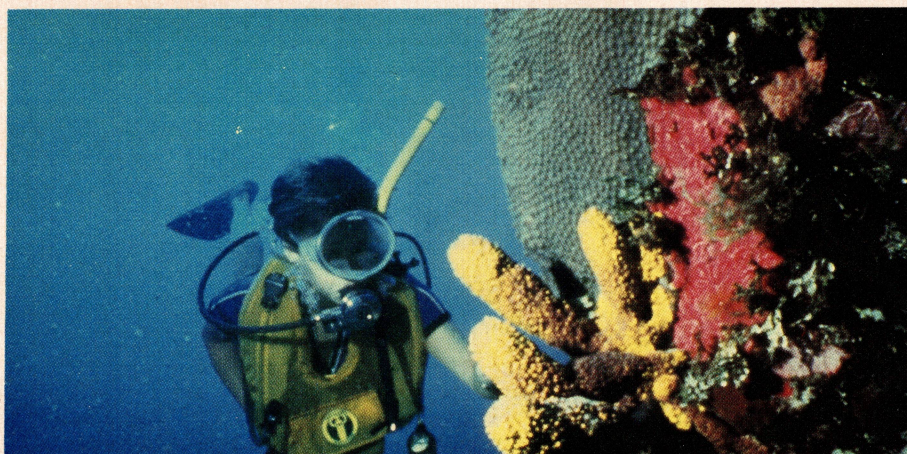
photos/Bill Mills

ing allow plenty of bottom time, so shooting one or two rolls of film is easy.

The ride back to the dive center is pleasantly dry. Ice cold watermelon and cool drinks are standard fare for the short journey home.

Hollywood, too, has taken a liking to western New Providence. Much of the Flipper series was filmed at the Dolphin Pins, just west of South Ocean Beach Hotel, as were segments of the movie *Thunderball*. The shallow coral gardens of Goulding Cay served as





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# haiti

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## BAHAMAS SECRET

underwater backlot for Walt Disney's *20,000 Leagues Under The Sea*.

Time spent not diving can generally be accounted for at the hotel's four lighted tennis courts, freshwater swimming pool, or professional 18 hole golf course. A variety of watersports, including waterskiing, snorkeling, and sailing is available at the Omorka Centre.

There are four daily shuttle buses into downtown Nassau (\$1 each way) and taxi service is always obtainable. An entire day can be spent exploring the Bahamas' capital city. The native straw market, Fort Montagu, and of course, Paradise Island, are just a few of the local sites around Nassau town. If you're looking for something a little closer to South Ocean Beach, try exploring the remnants of Old Fort, one of the earliest Spanish fortifications built in the Bahamas. A rusted cannon still stands guard over a now peaceful bay. The surrounding white sand beaches make excellent picnic spots. Just down the road is Traveler's Rest, a Bahamian tavern featuring a number of seafood delights — such as conch chowder and a variety of German beers.

Under the direction of general manager, Grover Moberley, the dive center offers resort scuba instruction, as well as equipment rental and air fills for certified divers. Soon to come will be a complete underwater photography service featuring Nikonos IV rental, instruction, and overnight processing of Ektachrome and Fujichrome film.

Situated on 5000 acres, much of it virgin forest, South Ocean Beach Hotel and the Omorka Dive Centre offer visitors an out island vacation, with international shopping bazaars and modern amenities only minutes away. Delta Airlines provides nonstop daily jet service to Nassau from New York, Atlanta, Dallas, and St. Louis with connecting flights from many others. All inclusive dive and golf packages to New Providence are available through Omorka Tours. For additional information write: Omorka Tours, P.O. Box 76721, Atlanta, GA 30328 or call (800) 241-7977.



"Looks like Alfred just met his first strobe!"



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For information on Dive Programs:  
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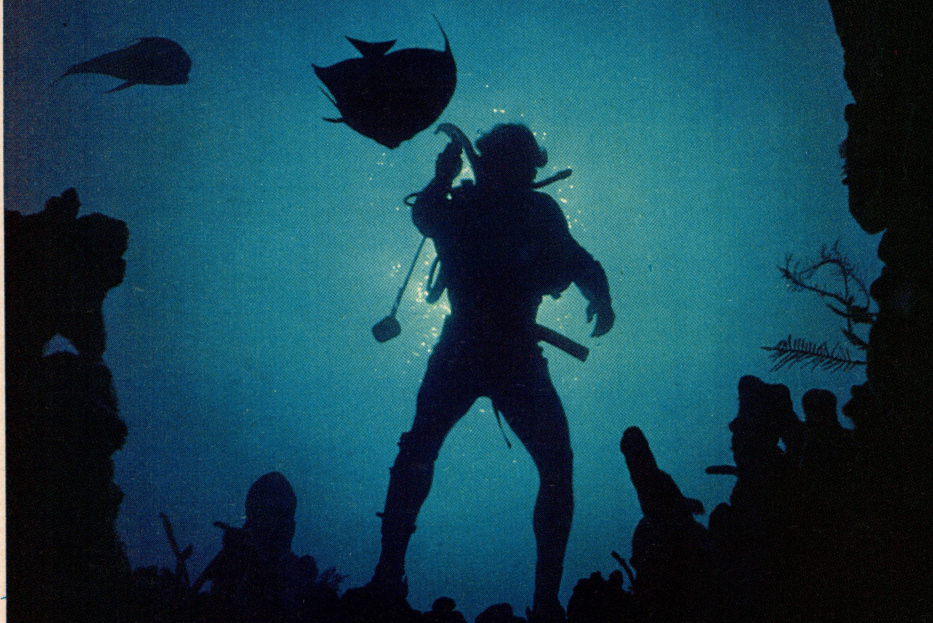


 **Chub Cay Club**  
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## RESORT REPORT CARD

Bob French, national sales manager for Sea Safaris, has initiated a new program for traveling divers: the Sea Safaris report card. The card will be sent to each traveler returning from a Sea Safaris dive



tour. It contains a welcome home message plus a space for accommodations, food, dive arrangements, the destination itself, an overall rating and comments.

Each critique is reviewed by Sea Safaris, then forwarded to the respective locale in order to provide better service and communications. Sea Safaris is presently offering dive tours to these areas: Tahiti, Micronesia, the Cayman Islands, Cozumel, the Bahamas, Roatan, Bonaire, the Red Sea and California. Write: 3701 Highland Ave., Suite 304, Manhattan Beach, CA 90266. 🐟

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The *Lammer Law*, recently launched in Canada, will be based primarily in Tortola in the British Virgin Islands. Operating on a year-round schedule of 8, 11 and 15 day cruises of the islands, she can be booked by individuals or parties of any size up to 18 persons. The whole boat can be completely chartered for private groups of up to 18 for cruises almost anywhere in the Caribbean.

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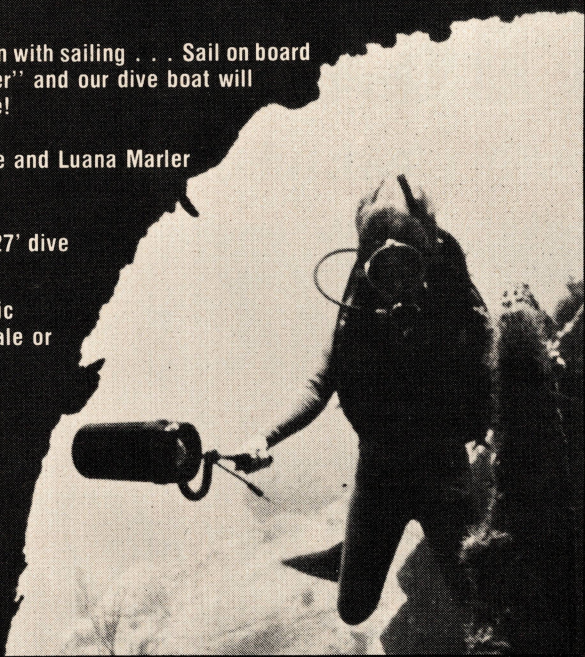
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## SOUTH CAROLINA A Treasure Chest of History

BY VESTA REA-SALISBURY

The morning haze hung like a ghostly mirage across Wadboo Creek and the surrounding swamp. Live oak branches were draped in gray-green Spanish moss, making eerie reflections across the shallow waters. The shoreline was outlined in alligator weed and cypress stumps; with the atmosphere being one of years gone past — rice plantations, slavery, Loyalists, Patriots and the Revolutionary War — where men long dead had slept in swamps, with a cypress-knee for a pillow and the sky for a roof.

Wadboo Creek, four miles northeast of Moncks Corner, South Carolina and a tributary of the Cooper River, had been a waterway since 1680 for both the supply boats moving produce from the plantations to market in Charleston, and the Patriots fighting for freedom after 1776. However, on this particular day the important task was the recovery of artifacts from yesterday's history.

Alan B. Albright, Underwater State Archaeologist from the University of South Carolina Institute of Archaeology and Anthropology, had just surfaced right at the foot of the air lift barge. "Not much happening down there today," he began. "Picked up a few pieces of pottery and an old strong box, plus an arrowhead. In this business, everyday can't be a treasure chest of uncovered wonders!" His eyes twinkled with the excitement of what he was doing, and although he had been doing much the same thing since 1973, it did not appear that he had lost any of his enthusiasm for his work.

Alan and his team of five divers had been investigating the creek for Revolutionary War artifacts for about one week, and it was estimated that they would be on the project for another four or five weeks. On this fall morning it was cold, and although they were diving only to an average depth of 8-15 feet, the water was chilly enough to require full wetsuits. The bottom of the creek was sand and compacted limestone, and the water afforded three foot visibility. The objective for the \$15,000 state-funded excavation was to obtain Revolutionary War relics to be placed in a yet-to-be-created Berkeley County Museum — the county in which the creek was located. But to Alan Albright, it was much more than that. The most important thing was that his divers were developing an



underwater grid system that allowed them to methodically cover a large research area in swift and opaque waters — on either flat surfaces or steep inclines — in any type of visibility. This technical research provided an advancement for future underwater archaeologists; but as a layman, I was far more interested in the actual recoveries. Probably one of the nicest discoveries was a silver-plated decorative shoe buckle. The divers were also uncovering musket balls, buttons, coins and pewter spoons, all believed to be from a supply vessel that sank during the Revolutionary War.

What amazed me was how Wadboo Creek, stretching back only seven miles into the swamp, could have anything worthwhile in it. It hardly appeared to be a waterway of any great significance, but upon reviewing my history, I soon realized why the underwater archaeologists were there.

Wadboo Creek lies 40 miles northeast of Charleston. Its brackish, tannin-stained water flows into the Cooper River and dumps into Charleston Bay. In the early 1700's the cypress swamps around the creek were cleared and diked by slaves and then made into rice and indigo fields. On February 5, 1705, a road was built from Moncks Corner to the creek and the new Wadboo ferry. Later at this location, a storage warehouse would be constructed to store produce coming from the upstream plantations. The building of this road, according to the South Carolina Assembly, was, "for the speedy conjunctions of our forces in time of war, as well as for the convenience of the inhabitants for all other occasions to resort at Charlestown." Primarily, with the aid of the ferry, it connected the eastern and western branches of the T of the Cooper River — the plantations' major navigable route. Little did the assembly know that its use in time of war would make it an underwater archaeological find in 1979.

Wadboo Creek is only one of several hundred historical and prehistorical artifact rich areas for the underwater explorer. Alan Albright could endlessly discuss the South Carolina University's Archaeology Department's many finds; however, there are two in particular that are of unusual importance.

A few years back, Albright and his team were asked to proceed to the Waccamau River in Georgetown County and excavate an early 1800's cypress canoe that was found protruding horizontally from a mud bank a few feet underwater. The project, upon first investigation, did not seem too difficult; however, upon closer observation opinions changed. The canoe measured 14 feet in length but, unfortunately, the old craftsman that had originally started the boat must have lost interest before completion, leaving the stump root system still attached to the dugout. Through

much effort, the seven ton artifact was removed from the river with canoe and stump intact. The dugout, stump and all, is now on display at the Rice Museum in Georgetown, South Carolina.

A second, even more historically significant discovery was the *Brown's Ferry Vessel*, which was recovered in 1796 in the Black River, also in Georgetown County, South Carolina — located about 60 miles north of Charleston. This vessel, thought to be one of the most important single nautical discoveries in the United States, dates back to 1730. It was 50 feet long with a breadth of 14 feet. It carried a cargo of 10,000 bricks or about 25 tons, and rested in 20-25 feet of water on a mud-rock bottom. The team of divers under Albright's direction worked in near-zero visibility, clearing tons of 200 years of man-made debris off the top of the nearly buried boat before they could begin the excavation. It appeared that the area the boat went down in later became a local dump site, which resulted in the tons of trash on top of the derelict. After five weeks of diving, this historic vessel was finally brought to the surface.

Following the recovery, it was submerged in a spring-fed farm pond to protect the timbers from drying out and crumbling. There it has remained until money was appropriated for conservation. Just recently, a \$300,000 grant was given to the South Carolina Institute of Archaeology and Anthropology to construct the largest conservation laboratory of its kind in North America — one of only six worldwide — for the purpose of restoring the *Brown's Ferry Vessel*. The ship, the earliest dated evidence of Southern craftsmanship recovered from American waters, will be treated with polyethylene glycol and put on display.

For the underwater explorer, artifact recovery is encouraged but controlled in South Carolina. Since 1968, the state has had an Underwater Salvage Law which requires all divers wishing to investigate these waters to purchase a hobby license — the cost is \$5 and license-holders are expected to turn in a monthly report to the Institute of Archaeology and Anthropology detailing what they have found and where it was located.

According to this law, 50 year or older artifacts that are found belong to the people of the state of South Carolina. Since South Carolina is a state rich in history, it should surprise no one that a great many hobby divers are involved in artifact recovery, both historic and prehistoric, on a regular basis. In 1973 there were only 12 hobby licenses issued, while in 1979, there were 800.

Alan Albright admits that the provisions in the law can be difficult to enforce, considering his small staff, but he has found that divers, in general, understand the need of preserving precious objects and appreciate the archaeologists who review their finds. Although the state can retain up to 50 percent of the re-

covery for the people, normally it takes only about 25 percent, with the diver determining the division according to equal value. Also, through the monthly reports, the institute gets leads for further investigations into areas they were unaware of.


Hampton Shuping, a dive instructor on a checkout dive, was the individual who discovered the *Brown's Ferry Vessel*. Because of the law, the institute received a report from Shuping telling of his discovery and reporting the location. Shuping realized the enormous historical potential of the boat and relinquished a major portion of his interest. By arrangement with the institute, he kept only those artifacts he had recovered prior to the institute's active involvement.

South Carolina is not the only state that carries an Underwater Salvage Law — North Carolina, Florida and Texas have legal provisions for recovery; but South Carolina is the only area that encourages the hobby diver to work with the professional archaeologist through the issuance of hobby licenses.

From the sportsman's viewpoint, Jack Williamson, manager of The Wet Shop in Charleston, agrees that for the diver coming to South Carolina, the trip can become a real artifact holiday. When Jack was asked his two favorite places to enjoy this activity, he suggested Cooper River and Edisto River.

The Cooper River is just northeast of Charleston. It is tidal water with an average depth of 30 feet and visibility not exceeding 12 feet — depending on the current. The river is primarily noted for its fossil beds laden with large prehistoric sharks' teeth.

The Edisto River is 30 miles south of Charleston, stretching from Edgefield, South Carolina to the ocean. This waterway is often referred to as a Black Water River because of tannic acid draining from the cypress swamps. Unquestionably, it is very picturesque as it winds romantically across the southern countryside. Rays of sunlight drift down between overlapping live oak limbs, and intertwined broadleaf trees cast shadows of the past on the water as it flows to the sea. The Edisto is swift, with a two to three knot current, and divers should use a boat when at all possible. Its depth averages 20 feet, with a visibility of six to eight feet. There were several plantations along the Edisto, making bottle hunting particularly good. Many battles of the Revolutionary War and Civil War were fought in this area, so artifacts from these periods are present. West Bank Landing at Jacksonboro is one of the favorite places of divers wanting to enjoy a day of adventure and recovery on this river.

True, the inland waters of the Carolinas are not crystal clear or emerald green, nor do bright colored fish play in and out of hidden coral crevices; but even now, in the bayou streams and flowing rivers, a diver in South Carolina can find a treasure chest of history! 



## DIVE SOUTH CAICOS

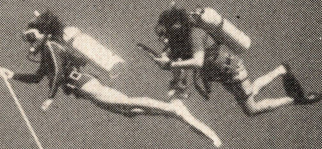
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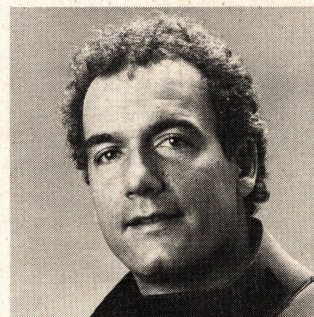
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## EVITAR JOINS LA MER

La Mer Diving Seafari, Inc. has announced that Rubi Evitar has joined the company. Evitar, master instructor in diving, will be active in promoting La Mer's dive expeditions to exotic locations around the world. He has been diving since 1969 for the Israeli Navy and is a



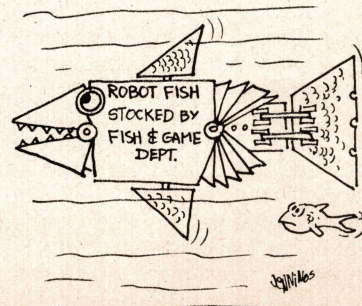
former chief diving instructor for many of the dive resorts in the Red Sea. He has been active during the past eight years as an instructor and tour leader in Sharm El Sheikh, Di-zahav and Neviot.

Evitar can be contacted at La Mer Diving Seafari, Inc., 823 U.N. Plaza, New York, NY 10017. Telephone (212) 599-0886.

## ATLANTIC ODYSSEY

A Caribbean businessman and his fiancée arrived in Newport, Rhode Island June 28th, two months after they left the Virgin Islands in their open-decked, 23 foot outboard speedboat. Charles "Dusty" Pearsall, 33, and Page Winter, 22, were exhausted but exuberant after their 3500 mile Caribbean and Atlantic Odyssey in 24-Karat, Pearsall's yellow fiberglass boat powered by two Johnson V-6 175-horsepower outboards.

Pearsall is a champion skin diver and is able to dive to depths of up to 100 feet without scuba gear, and remain underwater for two minutes. He was a participant in a CBS Sports Spectacular episode on shark tagging. The Pearsall brothers, Dusty and David, have won the Virgin Islands' Medal of Honor by the territorial legislature for their part in the rescue of survivors following an airboat crash near St. Thomas.





## STRAUS TO CIMI

Ross Turner of the Catalina Island Marine Institute has appointed Karen Straus to the position of Director of Educational Services. Karen has been involved in the dive industry for 12 years, ten of them as an instructor. She also has experience in writing and photography, marketing, promotion and dive travel. In addition to marketing CIMI's dive/biology programs to clubs and schools on the mainland, she will coordinate educational tours to tropical marine environments, and teach at the Toyon Bay facility. 🐠

## COME 'N' GO TO CAYMAN

Coralee LaFresnaye, president of Come 'N' Go Travel, Inc., Laguna Beach, CA has announced an exclusive group program with Ron Kipp, president of Bob Soto's Diving, Ltd. in Grand Cayman.

The program allows a group of 22 divers the exclusive use of Soto's Reef Diver dive boat for one week, with three dives a day, for five days, including night dives and one day on the North Wall (weather permitting) with two dives.

The groups will be staying at the Cayman Islander Hotel for seven nights. Rates include: diving, accommodations, transfers from hotel to boat and back, taxes and gratuities.

Until April 30, rates are \$400 per person. From May 1, 1981 until Nov. 30,

rates are \$325 per person.

For further information contact: Come 'N' Go Travel, Inc., 1153 S. Coast Hwy., Laguna Beach, CA 92651, (714) 497-2402. 🐠

## OSPREY JOINS PLUS ULTRA

Capt. Klein's Scuba Shop has announced the arrival of Capt. Alex Kitchens and his brand new 31 foot diesel dive boat, the *Osprey*, to the Holiday Inn Docks. The custom built *Osprey* joins the *Plus Ultra* for diving and snorkeling charters in the Upper Keys area and Pennekamp Park.

Lynn Williams is Capt. Klein's new Scuba Shop manager. Her many years of experience in the business should be a big help to divers new to the Florida Keys. 🐠

## PINTA FOUND?

Treasure hunters say the *Pinta*, one of the three ships that sailed with Christopher Columbus in 1492, has been found off the Turks and Caicos islands in the Bahamas.

John Gasque, Olin Frick and a crew of 23 divers and archaeologists said they plan to return to the site to retrieve artifacts from a coral-covered wreck they believe is the *Pinta*.

Using records in the Spanish archives, and a 500 year old tax report, Florida historian Eugene Lyon has concluded that one of *Pinta's* owners, Vincente Pinzon, made a return trip to the New World around 1499 or 1500.

An iron cannon and a lead cannonball from the wreck, which Frick and Gasque found three years ago, have been determined to date from that period.

Mendel Peterson, former director of underwater archaeology for the Smithsonian Institute and now a shipwreck artifact appraiser, said he has "found nothing which would contradict" the treasure hunters' claim that their wreck is the *Pinta*. 🐠

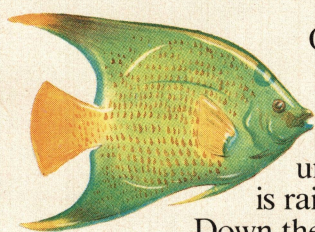
## SOTO SELLS

On October 1, 1980, Bob Soto's Diving Ltd., Grand Cayman, was purchased by Ron Kipp. Immediate plans call for the renovation of the headquarters facility in George Town, known to many as the Lobster Pot Shop.

Bob Soto's operation is the oldest and largest scuba operation in the Caribbean, and Soto has been retained as a consultant and chairman of the board. 1981 celebrates the 24th year of operation, and Kipp will place an emphasis on personalized group diving programs.

For more information, write airmail to Ron Kipp, Bob Soto's Diving Ltd., P.O. Box 1801, Grand Cayman, B.W.I. 🐠

# FAMOUS WATER COLORS.

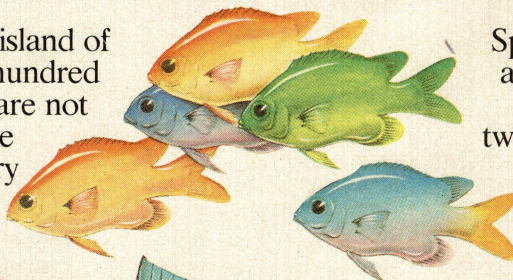


Off the Mexican island of Cozumel, one hundred foot visibilities are not unusual. And the underwater scenery is rainbow colorful.

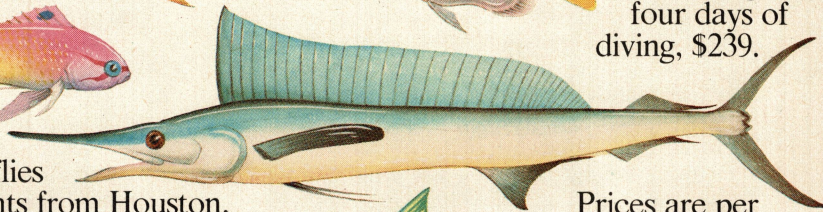
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# CONTINENTAL TO COZUMEL



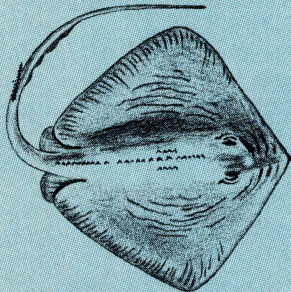
## The Southern Stingray

(*Dasyatis americana*)

Buried beneath a layer of sand, the ray lies hidden at the bottom of the sea, the outline of its flattened body barely discernible to the diver's unsuspecting eye. Suddenly the corners of the big bat wings begin to turn upward and the broad body arches in readiness for flight. Then, the wings rise, swiftly and powerfully thrusting downward, and the big fish flies away like a moon creature, discarding its camouflage of sand so that the diver sees it for the first time. □ Rays are among the most interesting inhabitants of the sea, and most divers are quite familiar with the wing-like pectoral fins, the round, flattened bodies, the whip-like tails that can sting and poison. Rays appear so different from the average fish that some people find it hard to believe they are fishes at all. Sharks and rays are in fact separated from all other fishes of the sea, classed together as Chondrichthyes (cartilaginous fishes). The other fishes are classed as Osteichthyes (bony fishes). The difference lies in their skeletons: Those of sharks and rays are comprised of cartilage, while those of the other fishes are comprised of bone. Some ichthyologists suspect that rays evolved from a certain type of shark, their pectoral fins expanding into wings for greater mobility and ease of flight. □ Rays are separated into several families, which include the whiptail stingrays (Dasyatidae), fintail stingrays (Urolophidae), eagle rays (Myliobatidae) and mantas (Mobulidae). The Dasyatidae family is characterized by the shape of the disk — rhomboid rather than round, with the snout and head of the animal indistinct from the rest of the body — and the development of skin folds on the tail. Dasyatids also have a pattern of tubercles on their backs which may be the reason for their scientific title. Dasyatid comes from the Greek, meaning shaggy or rough. The whip-like tails of Dasyatids are equipped with a dangerous, venomous spine which is so large and strong that it has been known to puncture the hull of a wooden boat or the heavy boot of a man. Divers and swimmers are cautioned to treat all stingrays with respect, be-

cause a puncture from such a spine can result in excruciating pain. □ *Dasyatis americana*, or the southern stingray, occurs in the Caribbean and is known from New Jersey to southeastern Brazil, including the Gulf of Mexico. Ichthyologists James Bohlke and Charles Chaplin indicate that it is a warm water migrant and is rare on the North American coast north of Cape Hatteras. There is a similar, counter-species, common above Cape Hatteras, called the northern stingray. According to the two scientists, *D. americana* is the only species of whiptail stingray recorded from the Baha-

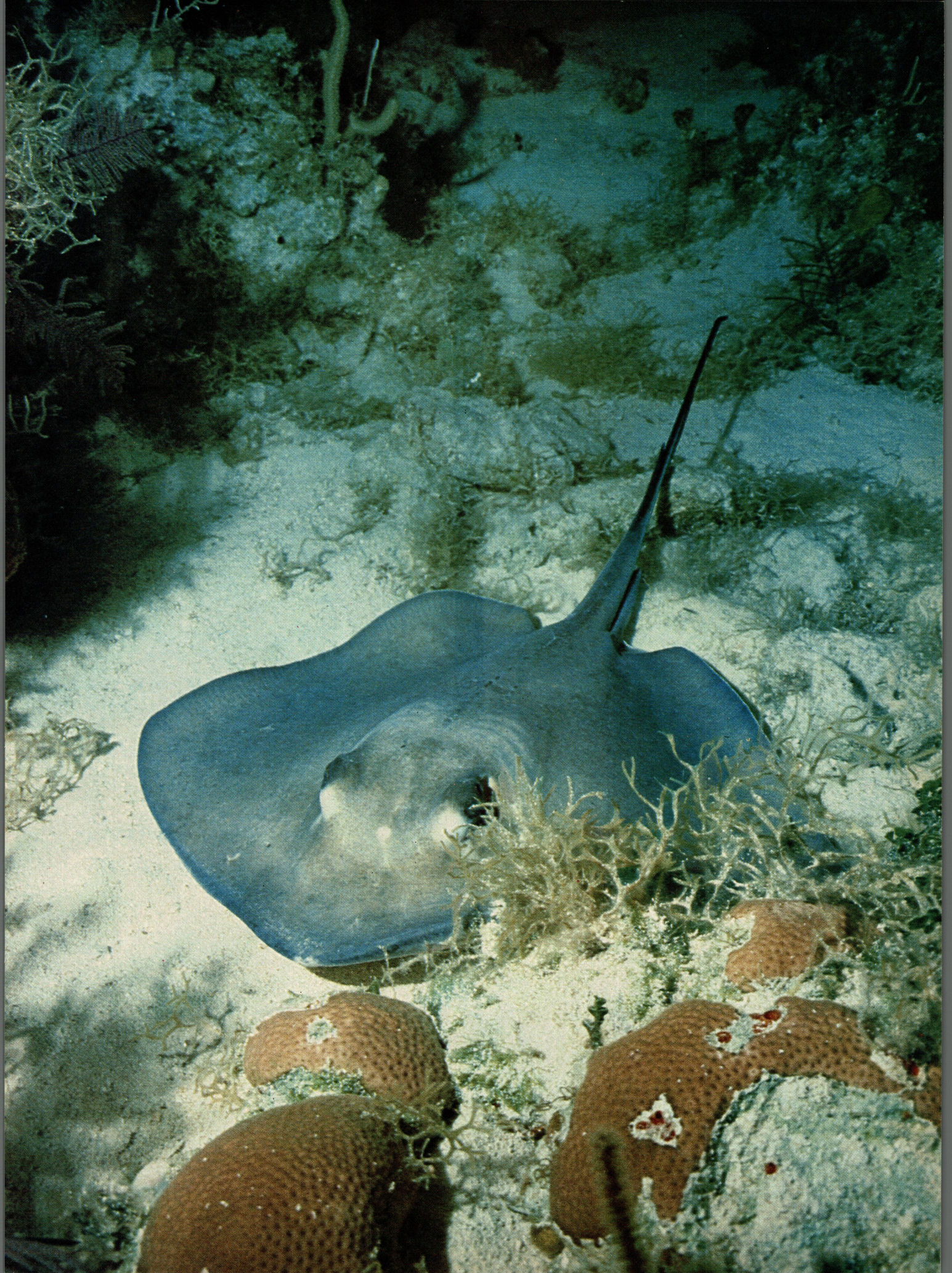
mas. It is common where found and is usually seen in shallow water in protected areas close to shore. □ Distinguishing characteristics of the southern stingray include a pale spot on the snout, just in front of the eyes, and a row of tubercles down the center of the back bordered on each side by additional short rows of 2 to

12 tubercles. The venomous spine is located a spine's length from the base of the tail, and the characteristic fold of skin originates at the spine and extends back along the tail toward the tip. The southern stingray is a large species, its wing span reaches a width of five feet. At birth, this ray has a wing span of almost eight inches. The color of the southern stingray can vary, depending upon the bottom on which it rests, but it is known to be gray, bluish, brownish or olive green. The undersides of all rays are white, as befits their bottom-dwelling existence. □ Dasyatids have strong teeth that can crunch through the hard shells of invertebrates and they typically feed by digging into the sand for their food. Bohlke and Chaplin record *D. americana* as feeding on clams, crabs, small fish, shrimps, stomatopods and worms. Typically, this ray will lie motionless on the bottom, settling down and throwing sand up onto its back with its pectoral fins to camouflage itself. The diver will usually only see the faint outline of its body and the large eyes exposed above the sand. It is easy to approach the animal; the wise swimmer will give the stingray plenty of room. 

*Photo By Dee Scarr - Text By Hillary Hauser*

The photo was taken in 40 feet of water in the Bahamas. Scarr used a Nikonos II with Seacor 21mm lens, Farallon/Oceanic 2001 strobe. Shot with Ektachrome 64 at f11, 1/60 second, three feet from the subject.







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You may recall Tektite I and II in 1969 and 1970. These scientific diving missions received broad media coverage

## Here Comes TEKTITE III

Text and Photography  
by Mark E. Gibson

that greatly enlightened the general public about the purpose and peculiarities of underwater hotels for saturation diving scientists. Both missions took place in the pristine waters of the Virgin Islands. Situated in 50 feet of water, a series of five person teams rented the habitat for stays of up to 60 days.

While the Tektite habitat allowed saturation diving to be used as a tool by scientists who preferred to live right in the experimental area, the National Oceanic and Atmospheric Administration had other uses for this steel chateau. In the 1960's this federal agency realized it could study many aspects of space living and travel at greatly reduced costs and effort by simulating outerspace situations in innerspace — the sea. General Electric was commissioned by NOAA to design and construct the habitat, and in 1969 it was baptized in the Virgin Islands.

The government was most interested in studying the effects of long-term confinement on the behavior, productivity, and physiological makeup of the guinea pig scientists. Six video cameras monitored activity in all four compartments (including the head and shower) and the habitat's exterior environment.

The diving scientists, whether on the habitat for two weeks or two months, voluntarily acclaimed how much work they were able to accomplish on their missions. Most of them wanted to stay longer or return for further missions.

In fact, one team was down and completed its 30 day mission. Toward the end it asked for, and received, clearance to stay down another 30 days — 60 days total without surfacing. As day 60 started to approach, the team, in a rather unexpected move, requested *another* 30 days — 90 in all for the mission. Top-

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side support personnel decided enough was enough, and said no. The coalition of five aquanauts however, decided yes and refused to surface for decompression and mission conclusion. Very soon the lights went out in Tektite. Two dark days passed before the scientists tossed in the towel.

The enthusiasm of the scientists stems from the tremendous productivity of their long dive, in contrast to the more typical ponderous workings in topside labor-

atories. NOAA, with its cadre of topside shrinks glued to the video screens 24 hours a day, concluded that life in Tektite was pretty good, and with that parting thought they withdrew their interest in the project.

The habitat Tektite went into cold and dusty storage as General Electric reviewed various proposals for the inner-space station, including the most realistic approach of installing the hulk as a playground fixture. Fortunately, many

people believed that this was not the most useful application of man's undersea hotel.

Dr. Ross had spent many weeks in the Virgin Islands as he volunteered his medical services on the support team. Upon hearing that his beloved undersea habitat was about to be sliced up, he moved quickly and brought his interest to bear upon the top executives of G.E.

Dr. Ross bumped into, not entirely by accident, a solitary man at a cocktail party.

"He asked me if I wanted it. I didn't even know who he was! But he knew me. He said if I wanted it, it was mine. I questioned whether he would recall tomorrow his rather astounding offer, but the next day he followed through."

With this man's assistance, and that of G.E.'s president, whose desk was deluged with letters asking for deliverance of the habitat, Hal Ross was asked to, "Come pick it up." The Tektite non-profit corporation was created as Hal left his research position at the University of California, and the 72 ton innerspace station was shipped in pieces on four trucks to San Francisco in 1977.

Since then the Tektite volunteers — coordinated largely by Tim Kelley, veteran technician for the *Andrea Doria* — have been cleaning, fixing plumbing and wiring, and painting the habitat in preparation of forthcoming missions — Tektite III.

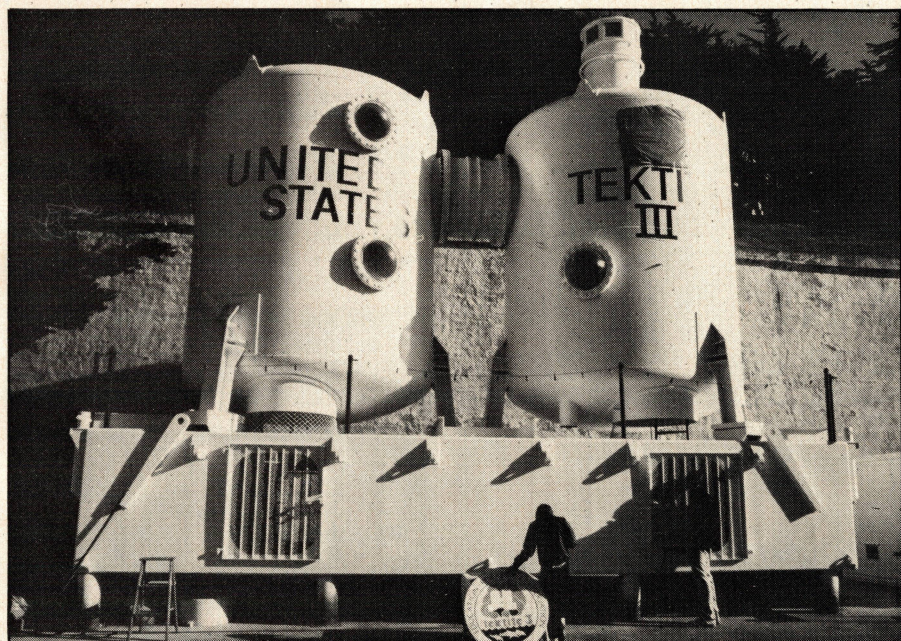
Dr. Ross' plans call for the deployment of the habitat in the waters near San Francisco.

The habitat will be firmly weighted to the seafloor with 40 tons of scrap metal. A support buoy and barge will contain the life support systems — one is completely separate from the other in case problems develop with the one in operation.

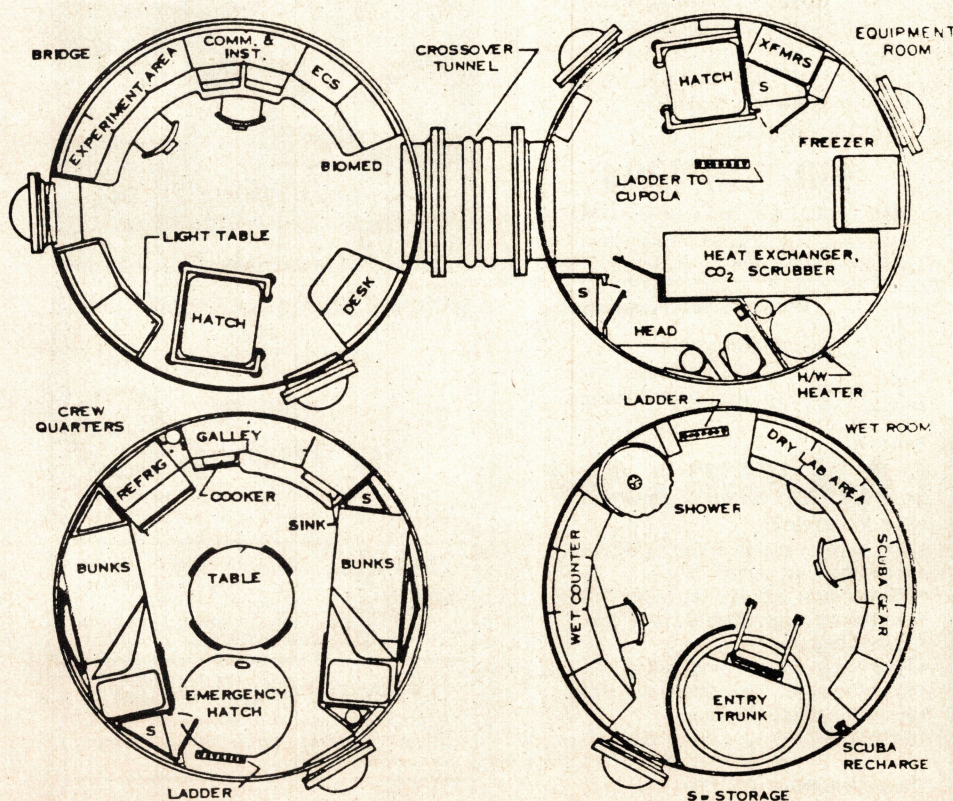
So just what is a group of highly motivated divers going to do with this inner-space station? Project Tektite addresses the habitat exclusively, while the Tektite Society has a membership orientation dedicated to diving and marine science research and education. A special school is being formulated to educate and train divers in such important areas as navigation, engine maintenance and repair, survival techniques, marine science, electronics, advanced diving, and marine industrial technology.

This novel combination of disciplines is intended to turn out divers with comprehensive skills in marine technology — something Dr. Ross believes there is an increasing demand for.

Tektite III, overall, will be a saturation diving habitat to support progressive marine research, and it will also embody many educational and training programs open to the public. Relocated now to the Pacific Coast (from the Virgin Islands), Tektite, and its friends, will enjoy a marine environment that has never been explored, or appreciated, by similarly equipped divers. 🐠



Plans call for the underwater placement of the 72 ton Tektite habitat near San Francisco.



Internal plan of the habitat's compartments



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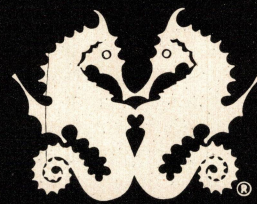
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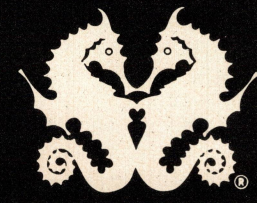
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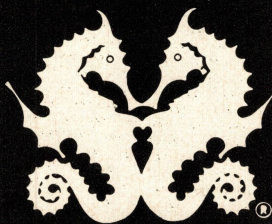
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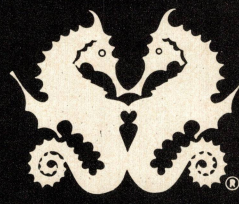
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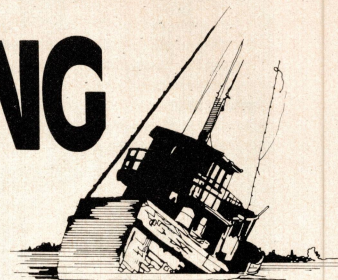
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# WRECK DIVING

## ON FLORIDA'S GULF COAST

By Nancy Thomasson Swiley



"Heh, we just picked up a spike on the scratcher! I see three 20 pound grouper, a 150 pound jewfish and a couple of the healthiest snappers you ever looked at. We are setting the anchor now. You guys better come on over and tie off before we get all the fish," cracks a teasing voice.

"On our way," comes the curt reply over a CB as other dive boats point their bows toward the source of the exuberant voice.

If you happen to monitor a Citizen Band radio (CB) on a weekend morning, this is an example of the diver conversation you might hear. And, if you are fortunate, you might see the boats making the rapid-fire comments. The first indication that they have hit a wreck comes in the form of a bleach bottle or buoy being tossed from a boat that is circling and criss-crossing over the expanse of blue water. After that, silence, for about 45 minutes since the sources of conversation have rolled over the boat sides and are now enjoying some spectacular wreck diving along the Central Gulf Coast of Florida.

Inevitably, when people learn that I dive the Gulf of Mexico from St. Petersburg north to Port Richey, their reaction is, "That filthy water! What's out there?" Give me five minutes to describe the wreck diving of the previous weekend and the routine questions begin. "Are you going out this weekend? Can I come along?" or a more cautious, "Maybe I should go out there sometime."

The wrecks that Tampa divers jump in on are not Spanish galleons by any means. However, they have their own treasures in the form of marine life and the spice of adventure, which, like narcotics, keep divers coming back again and again.

If curiosity is your impetus for making a wreck dive, then by all means roll over the side, because gulf wrecks offer an interesting assortment of experiences. On a wreck like the *Gunsmoke*, the shrimp nets are still hanging high above the decks and the engine-room can be entered through windows and deck doorways. The *Gunsmoke* was a shrimp boat discovered floating off St. Petersburg, deserted, with the sea suction hose cut in an effort to scuttle her. The Coast Guard picked up several bales of illegal

drugs floating in an oil slick when they arrived to investigate. Yet the clues were sparse as the *Gunsmoke* slipped beneath the waves on January 27, 1977. One can imagine the ghosts of her former owners roaming the decks. To enhance the excitement, a jewfish just might be glimpsed through a beam of light focused into the hold amidships. Grouper and baitfish hang motionless in the rigging, watching divers curiously.

Some of the largest barracuda a diver ever wants to see make their homes on a B-29 plane wreck out of New Port Richey. They watch the divers, and one eight foot monster blocked the end of the fuselage as I swam into it. Since he was the bigger of the two of us, I retreated and let him have the fuselage. This wreck lies in 40 feet of water and includes the wings with part of the fuselage, as well as the crankshafts which housed the engines on the wings. Although the nose and tail parts are missing, two large propellers lie on the sand nearby. On one of the propellers we discovered a turtle. A diver grabbed the turtle to pose for a picture, only to find himself hitching a brief ride. The sea turtle eluded him, however, and grumpily swam away. The cobia swimming along the wing span reach lengths of up to six feet. When one of the cobias swam by a diver, she spotted a long piece of monofilament line dangling from its mouth. Upon spotting the line the diver and her buddy decided to try line fishing. They grabbed hold of the line and were taken for a wild ride until the line broke. It was hard to decide who was fishing for whom and who got away, the cobia or the divers!

Also out of New Port Richey, lying in 60 feet of water, are two wrecks within a quarter mile of each other. One is a tug resting on its side and the other is a barge sitting bottom up. On the tug one day a ten foot nurse shark was spotted by one of the first divers to reach the bottom. He swam over to me and beckoned for me to follow. As I took aim with my camera, the shark began swimming out of the hull. As the shark vacated the premises, it swam between the feet of another diver who, up to that point, did not know why we were all at the end of the tug. Although the shark did not seem concerned about the diver in his way, there was quite a reaction of surprise from the diver!

On the hull of the tug one may see file-




fish grazing in the seaweed and sponges. They look like bronze dinner plates as they swim over the hull and reflect the light from a strobe or flashlight. This same site also hosts a jeep upturned on its side with wheels sticking up in the air and gauges from the dash hanging downward and useless.

Another wreck which is interesting to dive is the *Mexican Pride*. Out of St. Petersburg, lying in approximately 120 feet of water, this wreck sits upright and is over 200 feet long and 75 feet wide. Although the superstructure is gone, the decks can still be explored through the openings on deck. It is exciting to swim into the wreck and follow the corridors while shining lights into startled fishes' eyes and having the light reflect back. Hairy triton shells are found on this wreck, as well as spiny oysters and other more common varieties of gulf shells. Part of the attraction of the *Mexican Pride* is that it lies very deep, so the currents are strong. Divers must be cautious so they do not exceed their bottom times and have to decompress on the way back to the surface. With less than one-half hour of safe bottom time, it is a challenge to see just how much of the tanker can be explored before one has to return to the surface. As divers reunite on the surface a common question is, "Where did you guys go?, How far down the hull did you swim?" The answers to these questions are unanimously an expression of regret that the entire ship was not explored, and a promise to return.

Different kinds of fish can be seen swimming on the wrecks during the various seasons. For example, during the winter and spring months large schools of spadefish swim above such sites as the *Ten Fathom Wreck* and *Clearwater Wreck*. The schools may include as many as 75 members. Watching these fish exchange places in a particular formation brings to mind the evening traffic rush on Tampa's Interstate 275. Juvenile angelfishes, with their bright yellow and blue coloring, dart among the sponges and seaweed growths which cover the wreck. The adult blue angelfish peer out inquisitively from wreck debris with mouths pierced as though questioning the diver's purpose.

With the advent of Loran C stations in Florida, and Loran C units being marketed at an affordable price, wrecks have become easier to locate.

One can see that wreck diving offers a variety of experiences, from spearfishing, to collecting shells, to satisfying man's innate curiosity about the unknown. The assortment of sites range from the 120 foot depths of the *Mexican Pride*, to the 30 foot depths of the *Redington Shores* artificial reef. There are hulls sitting upright, and hulls twisted and nearly unidentifiable because of dynamite charges. Hulls are found in pieces, and turned upside-down, forming hiding places for the reef fish. 

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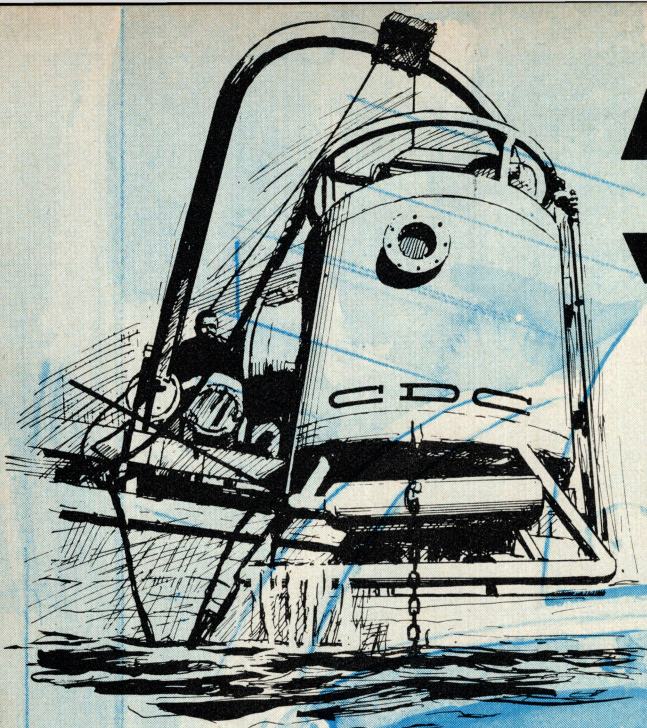
*Peter Hughes*

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# DEMA

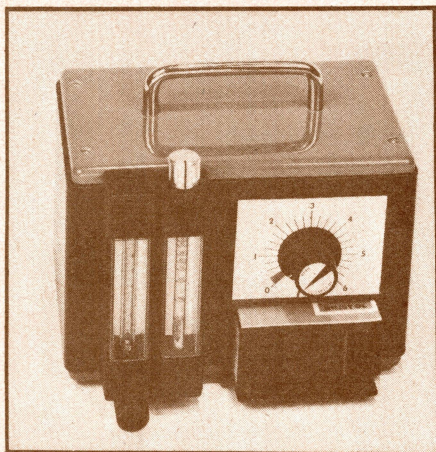
LAS VEGAS

**the show that unveils  
diving's new goodies For 1981  
by Bonnie J. Cardone**

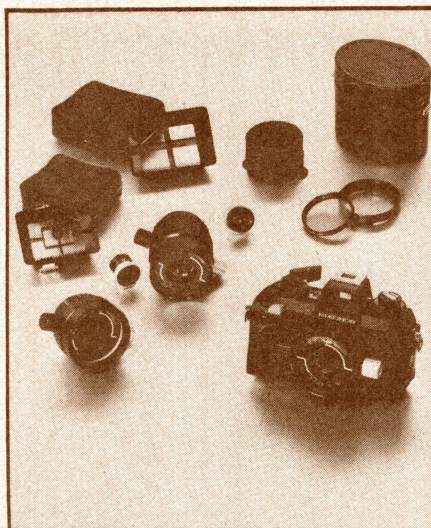
Once upon a time, when television was relatively new, much was made over new car models each fall. Viewer interest was whetted by ads showing the new models tantalizingly covered from bumper-to-bumper. Everyone eagerly awaited the day when the new cars would be unveiled. A freshly designed hubcap, just barely showing beneath a sheet, attracted as much attention as a well-turned ankle glimpsed below a long skirt in the early 1900's. As fall approached there was mystery, anticipation, intrigue and rumors galore.

Much the same atmosphere prevails in the months and days preceding the annual DEMA Show. Everyone who's anyone in the dive industry will be there, and dive companies have been busy researching, designing and testing new products to unveil at the show. On the following pages we show you what's new in dive gear for 1981. But don't expect to see all of these products in your dive stores until spring or summer. SKIN DIVER is published three months in advance of its sale date and many products were only prototypes when they were photographed. (One prototype was made of wood!) Although these products are in their final form by the time they appear at the show, most companies are not yet geared up to produce them *en masse*. Thus, you'll just have to wait if you're really interested in buying some of them. But, in the meantime, let's do away with the mystery, anticipation, intrigue and rumors. Turn the pages to find out what's new in Las Vegas at the DEMA Show this year . . .

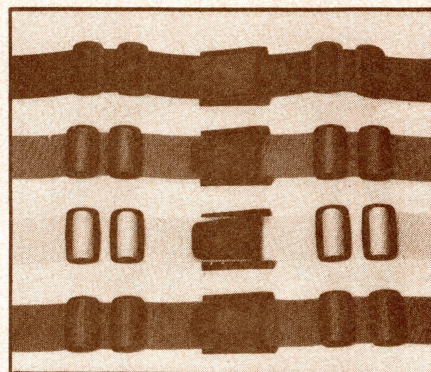




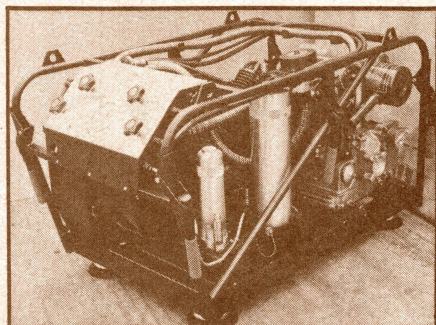
**AMERICAN BRISTOL, Test Cube**  
Tests compressed air



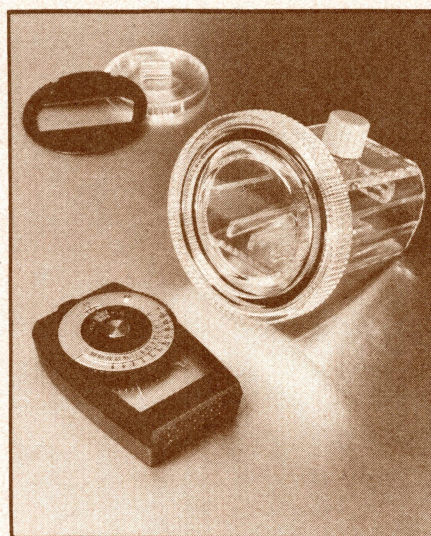
**AQUA-CRAFT, Nikonos IV-A**  
U/W camera and accessories



**AQUA-CRAFT, Bullet Weightbelt**  
Plastic buckle, four Delrin slides



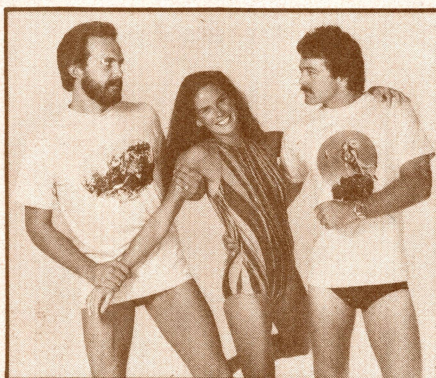
**AMERICAN BRISTOL, BP10 50**  
Diesel powered portable compressor



**AQUA-CRAFT, Sekonic L-158**  
Light meter with housing



**AQUA-CRAFT, Kan Coolers**  
Fits almost any can or bottle



**AQUA-CRAFT, T-Shirts**  
Five color designs on 100% cotton

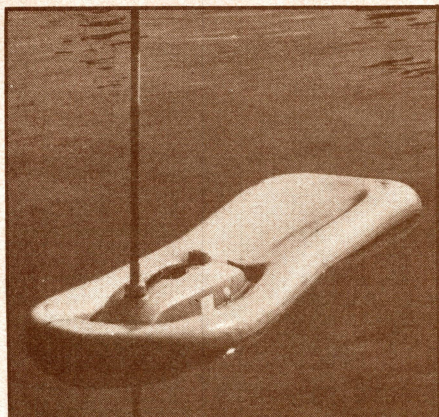


**AQUA-CRAFT, SB-101**  
Nikon's automatic U/W strobe

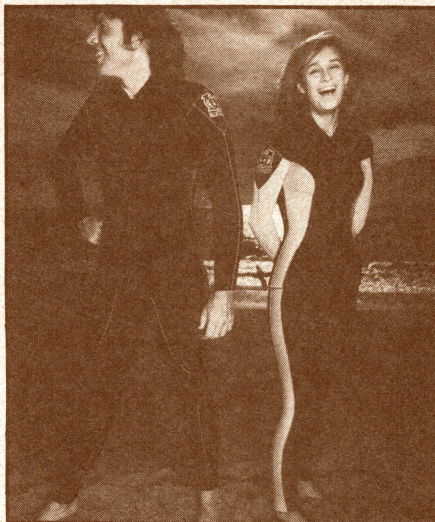


**AQUARIUS, Double Pocket Duffel**  
Three and one-half foot capacity





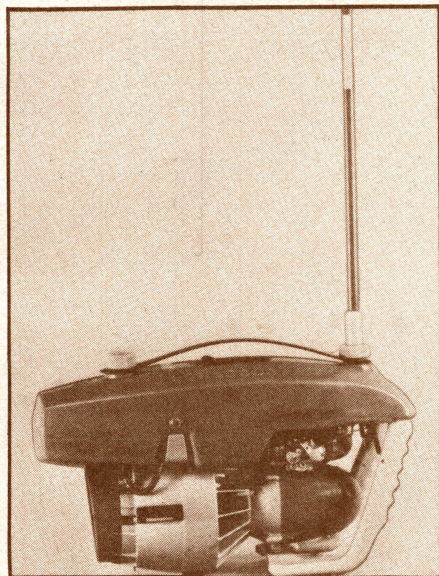
**AQUASCOOTER, Belly Board**  
Steers like a toboggan



**BLUEWATER WETSUITS, Striker**  
Nylon-two/lyrca suit



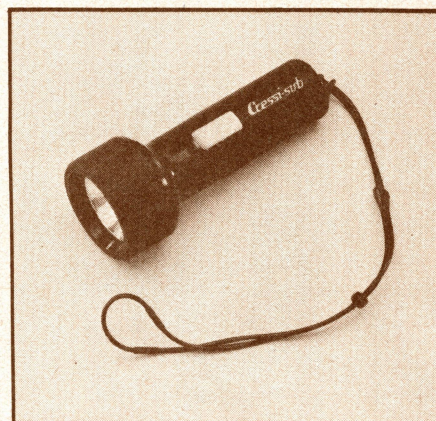
**CRESSI-SUB, Occhio**  
Low volume mask



**AQUASCOOTER, AS450**  
Surface propulsion vehicle



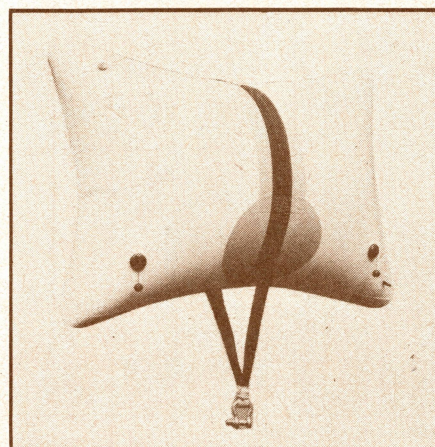
**BLUEWATER WETSUITS, Thin Line**  
French-cut Suit/Spring Suit



**CRESSI-SUB, Mini-Flash**  
Small light with a magnetic switch



**BARESKIN PRODUCTS, Bare-a-cuda**  
Inflatable one-piece suit

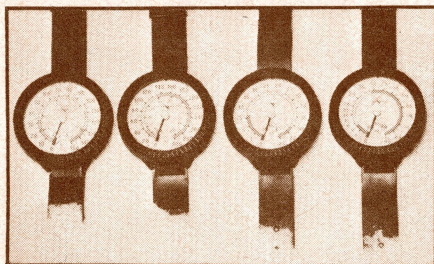


**CARTER BAG, U/W Lift Bag**  
1000 pound lift capacity

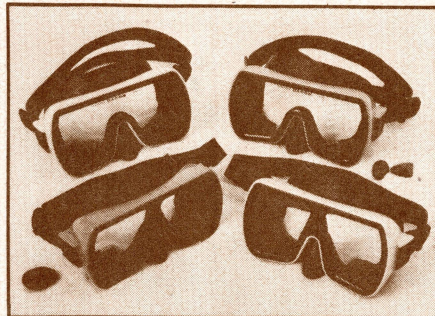


**CRESSI-SUB, Gear Bag**  
Waterproof Cordura, plastic zipper





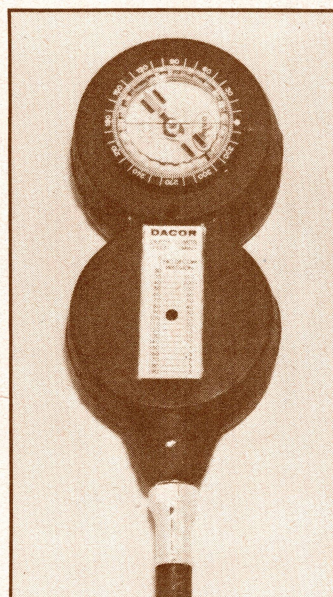
**DACOR, LFG 150**  
Silicone filled, phosphorescent dial



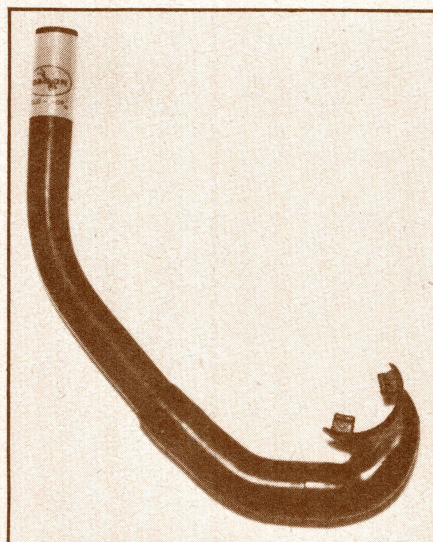
**DACOR, Vista**  
Low volume, lightweight masks



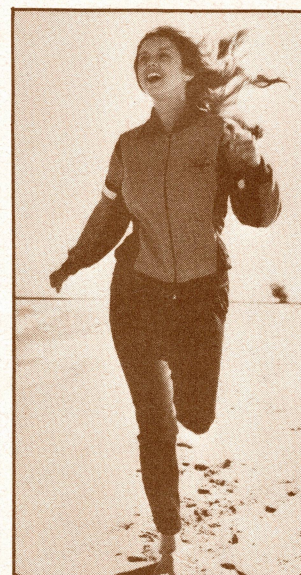
**DACOR, Wetsuits**  
Durable Thermo-Skin II material



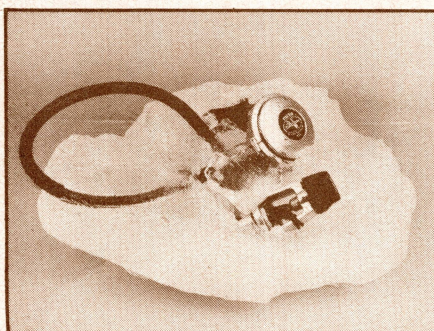
**DACOR, IC3 Console**  
For SPG, depth gauge and compass



**DACOR, ATS Snorkel**  
Large diameter, adjustable tube



**DACOR, WUS Warm-up Suit**  
Polyester/cotton outfit



**DACOR, AER Pacer**  
All-environmental regulator



**DACOR, Dive Jackets**  
One-eighth inch, in royal blue

*The Leader*

**DIRT SHIRTS**  
INTERNATIONAL

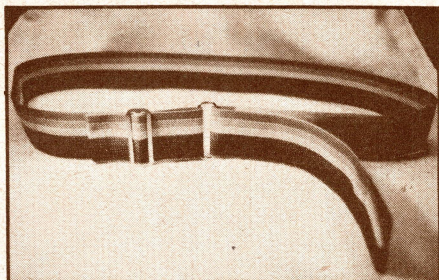
*Sports Action T-Shirts*

**DIRT SHIRTS INT'L, T-Shirts**  
Action shirts for divers

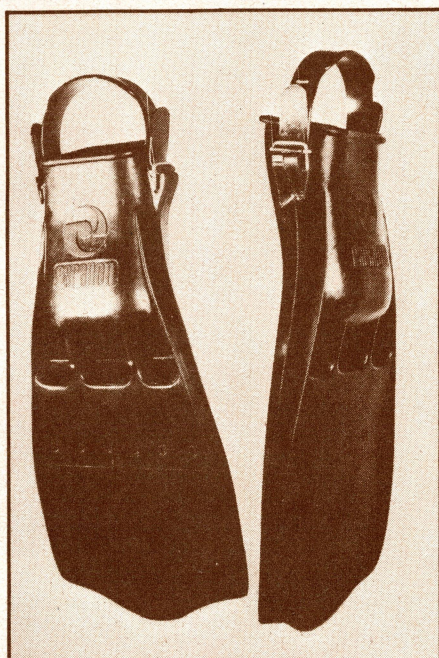




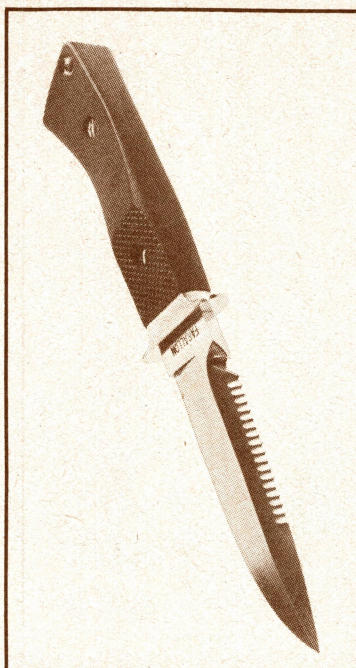
**DOLT OF CALIFORNIA, Dive Bags**  
Waterproof, double/triple stitched



**DWD, Weightbelt**  
Self-fastening velcro closure



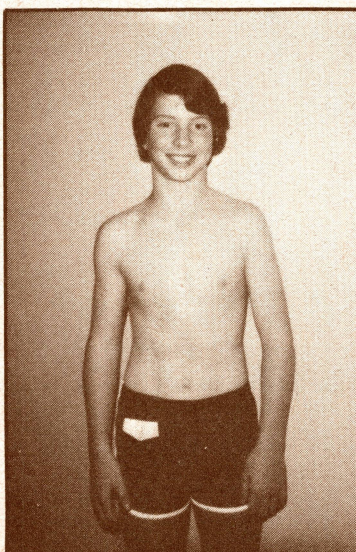
**FARALLON/OCEANIC, Fara-Fin X**  
Vented for power



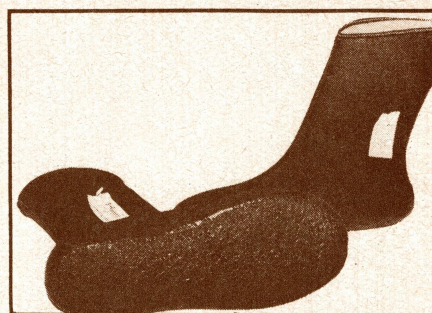
**FARALLON/OCEANIC, Talon**  
Small knife with a keen edge



**FARALLON/OCEANIC, Booties**  
Textured neoprene, molded sole



**GULBENKIAN SWIM, Boxer Short**  
Nylon tricot, with key pocket



**HARVEY'S, HG55**  
Nylon-two, molded booties



**HENDERSON AQUATICS, Gloves**  
Five-finger design, long cuffs

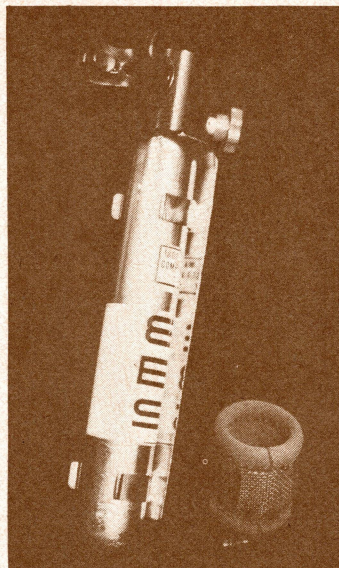


**HENDERSON AQUATICS, Aqua-Tux**  
Lycra suit in blue or silver





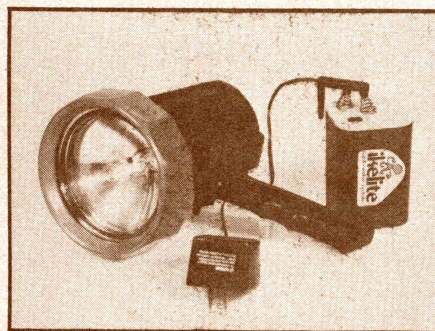
**HENDERSON AQUATICS, Drysuits**  
Lycra, in silver, black or navy



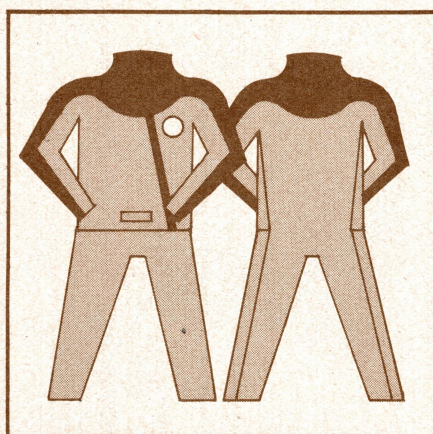
**IMPERIAL, EBS**  
Compact, lightweight air supply



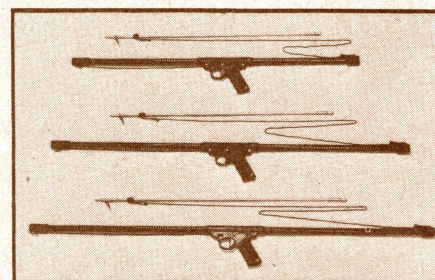
**KING NEPTUNE, Suit Fix**  
Neoprene cement with applicator



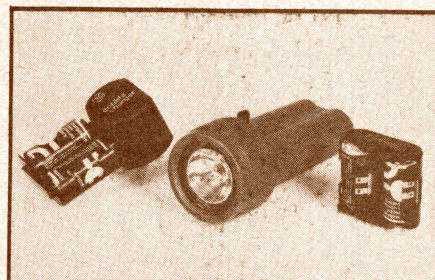
**IKELITE, Ikelite II**  
With rechargeable battery, charger



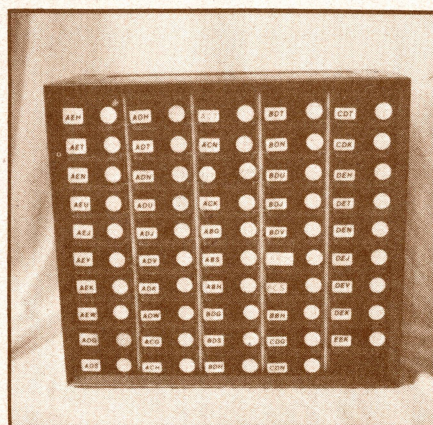
**JUMP-IN-JAC, Wetsuit**  
Nylon-two, one-piece suit



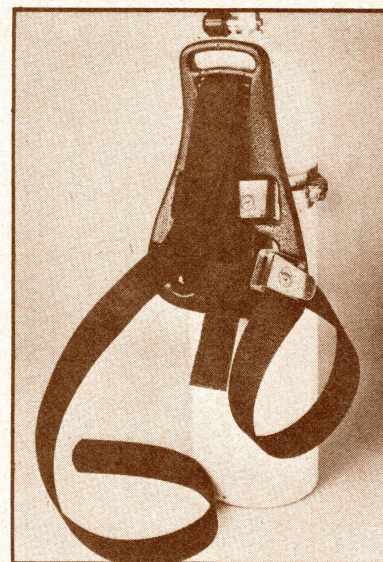
**MARLERA SEA SPORTS, Spearguns**  
Spring-powered, three sizes



**IKELITE, Mini C-Lite II**  
Small, rechargeable, bright



**KING NEPTUNE, O-Ring Organizer**  
Storage for all types of O-rings



**PARKWAY, Backpack**  
Lightweight, injection molded body

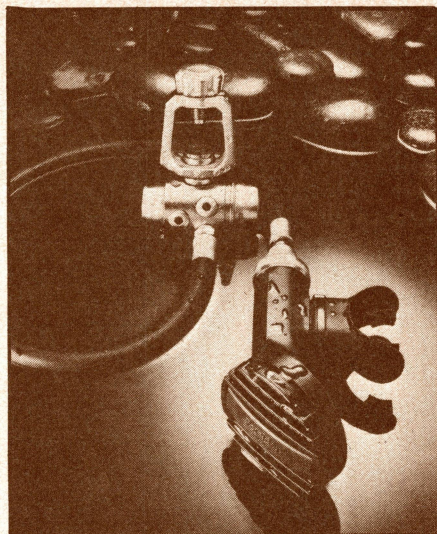




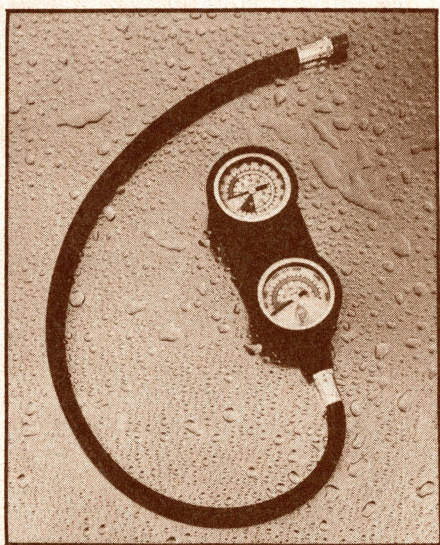
**PARKWAY, Grabber**  
Four-finger design in nylon-two



**PARKWAY, Wetsuits**  
Colorful, triple-striped lycra



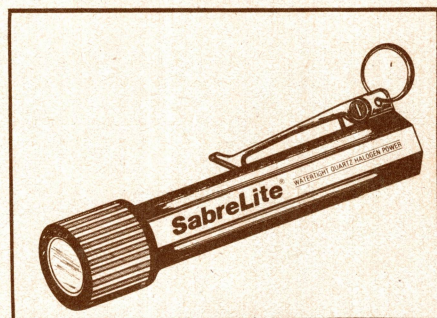
**PARKWAY, Cyklon Maximum**  
Turbo-assisted regulator



**PARKWAY, Console SPG/depth**  
gauge in high-impact plastic



**PARKWAY, Windsurfers**  
Nylon-two combo for water sports



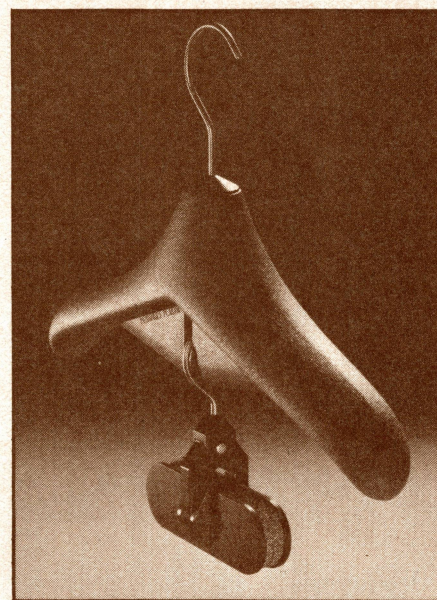
**PELICAN PRODUCTS, SabreLite**  
Small, bright, rechargeable light



**PARKWAY, Jetsuit II**  
Attached, molded rubber booties

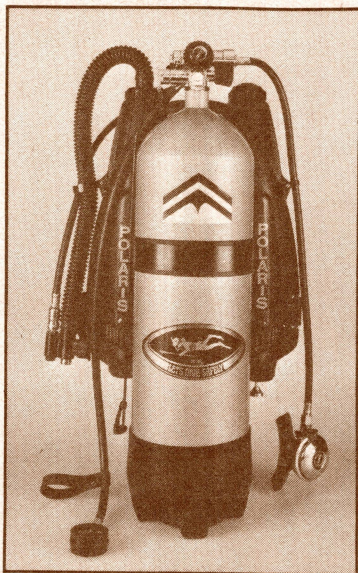


**PARKWAY, Equalizers**  
BC's in stripes or solids

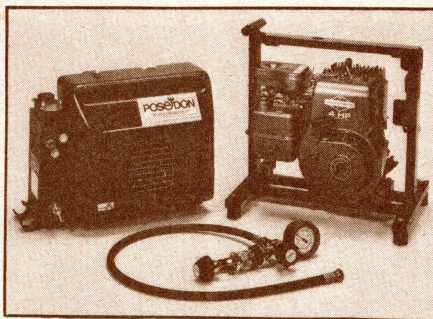


**PENNFORM, Hanger**  
For wetsuits and drysuits





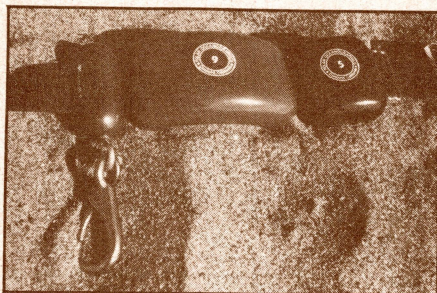
**ROSALYN INTERNATIONAL, Polaris**  
Hard-shell buoyancy control system



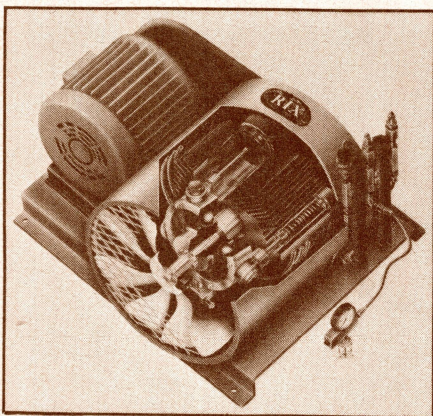
**POSEIDON KOMPRESSOREN, Universal**  
Portable compressor weighing 32 kg



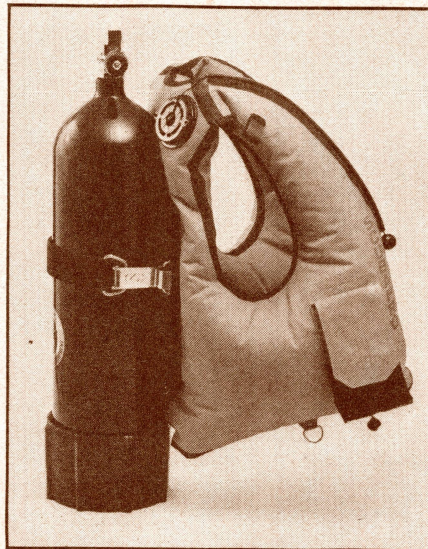
**SCUBAPRO, Dirk Knife**  
Stainless steel, small and efficient



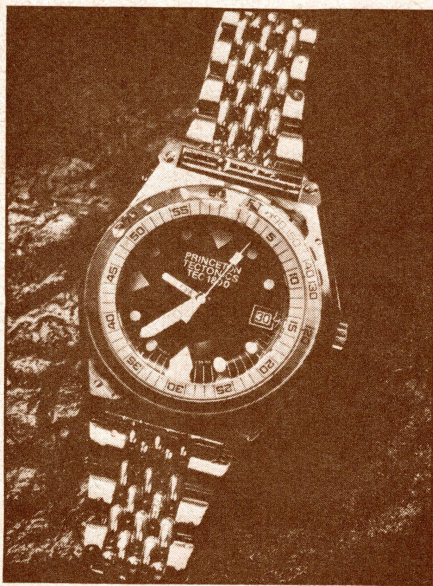
**POLAR OCEANOGRAPHICS, Weights**  
Vinyl-coated, from 1½ to 10 pounds



**RIX INDUSTRIES, Compressor**  
Oil-free design



**SCUBAPRO, Stabilizing Jacket**  
Remote dump valve, tank band



**PRINCETON TECTONICS, TEC-1800 /**  
Quartz dive watch

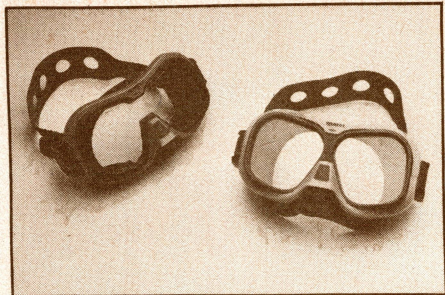


**SCUBAPRO, Test Team Cap**  
Plastic inner visor, mesh back

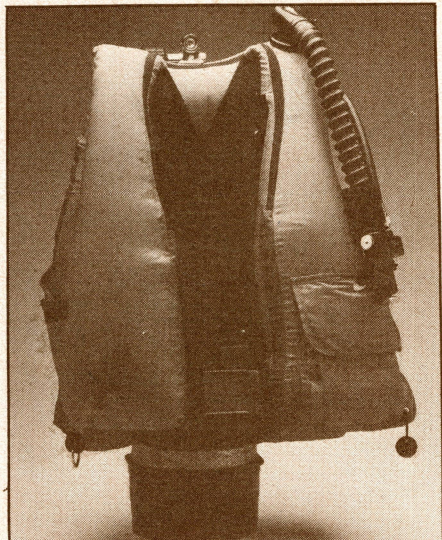


**SCUBAPRO, Regulator Box**  
Crush-resistant polyethylene plastic





**SEAQUEST, Formula I and II**  
Low volume, comfortable masks



**SEAQUEST, ProJacket**  
Economical vest



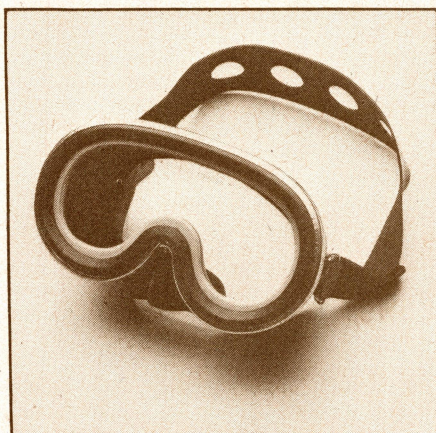
**SEAQUEST, SeaJacket III**  
Colorful stripes



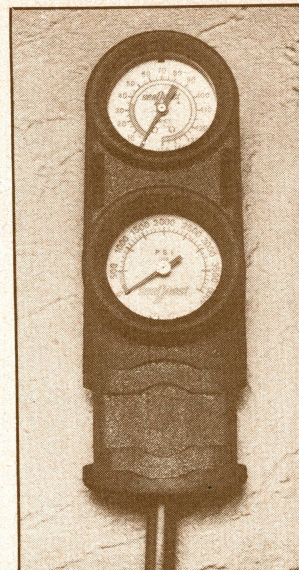
**SEAQUEST, Rough Water**  
Rugged, ballistic nylon BC



**SEAQUEST, POWER PLANA**  
Light weight, powerful fin



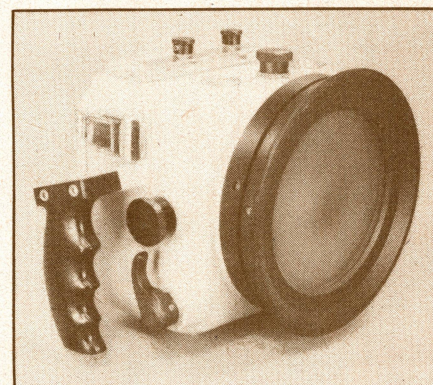
**SEAQUEST, Mini-Mondial**  
Low volume mask for smaller faces



**SEAQUEST, The Gauge Console**  
Depth, pressure gauges in rubber

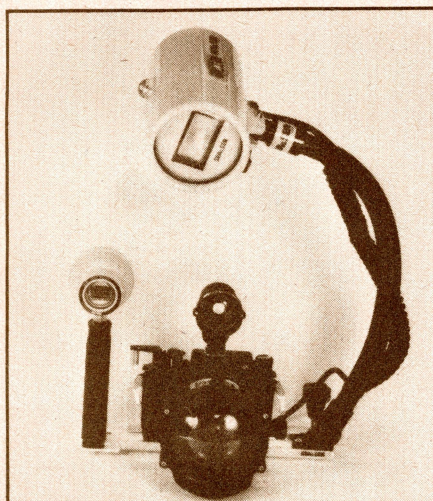


**SEA & SEA, Dive Light**  
Compact U/W light

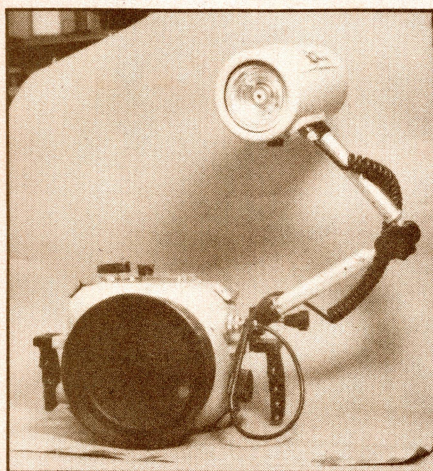


**SEA & SEA, U/W Housing**  
For Olympus OM-2





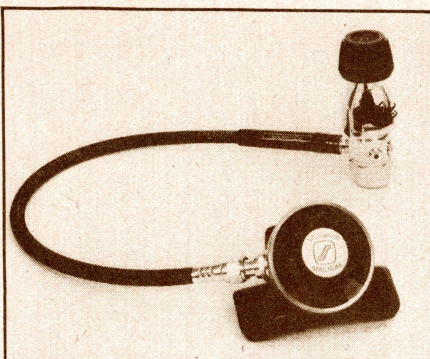
**SEA & SEA, Nikonos Accessories**  
Strobe, Sea Arm, Viewfinder, Meter



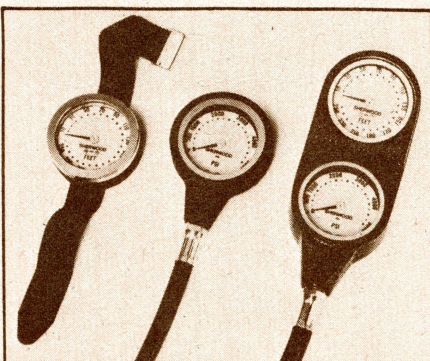
**SEA & SEA, Housing, Accessories**  
Nikon F-2 Case, Sea Arm, Sub 150



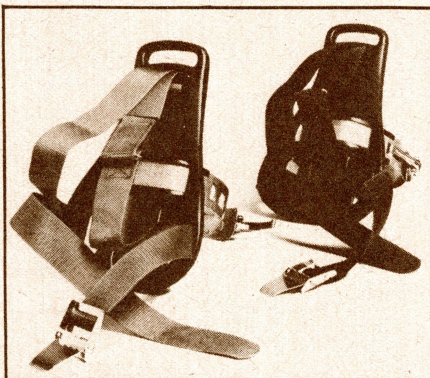
**SEA & SEA, Nikonos Accessories**  
20mm lens, Sea Arm, Sensor, Sub 50



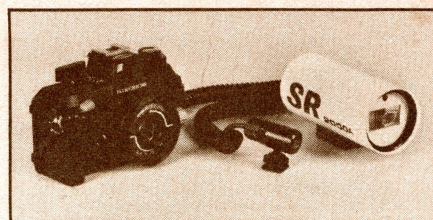
**SHERWOOD, Magnum Blizzard**  
Cold water regulator



**SHERWOOD, GC2000 Console**  
SPG, depth gauge, rubber case



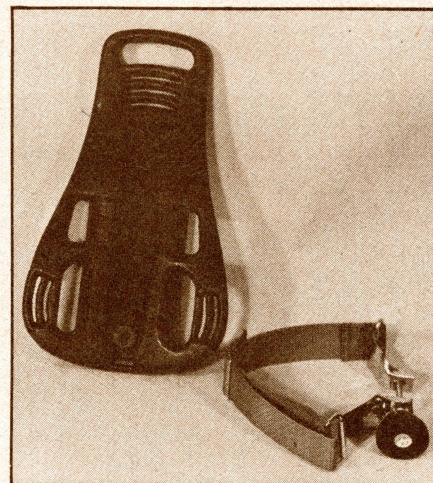
**SHERWOOD, Backpacks**  
Quick release, adjustable cam



**SONIC RESEARCH, SR2000A**  
Automatic, sync or slave strobe

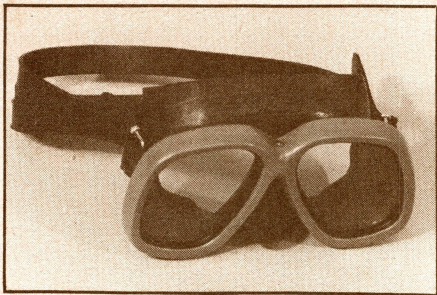


**SUB-AQUATIC SYSTEMS, Safe Pac/Jacket**  
Back-mounted BC system



**SUB-AQUATIC SYSTEMS, Backpack**  
Contour pack, adjustable nylon strap

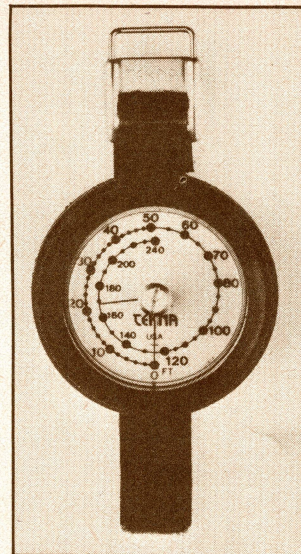




**SUB-AQUATIC SYSTEMS, 2076**  
Low volume, all-purpose mask



**SUBSEA PRODUCTS, Mark 30**  
Uses rechargeable, disposable batteries



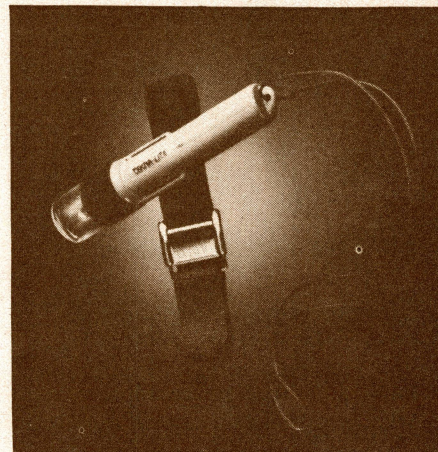
**TEKNA, Max Depth Gauge**  
Calibrateable for accuracy



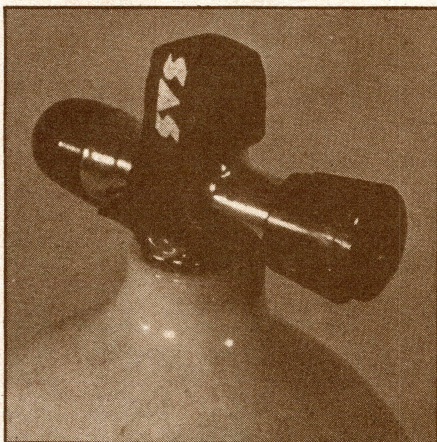
**SUB-AQUATIC SYSTEMS, 9009 Glove**  
Neoprene body, leather palm, fingers



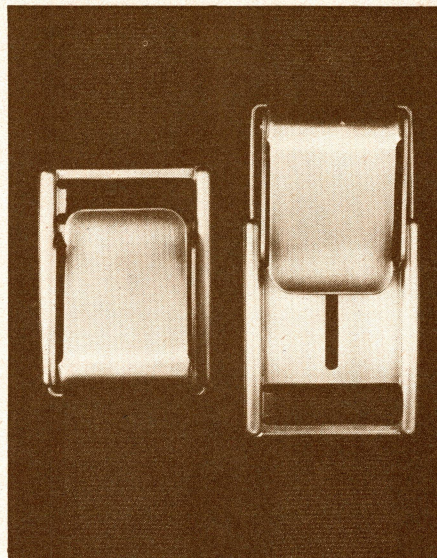
**SUBSALVE USA, Lift Bags**  
Bright yellow for good visibility



**TEKNA, Mini Strobe**  
40-50 flashes per minute



**SUB-AQUATIC SYSTEMS, Valve Cover**  
Nylon-lined neoprene protector



**TEKNA, Belt Buckle**  
Spring-loaded stainless steel

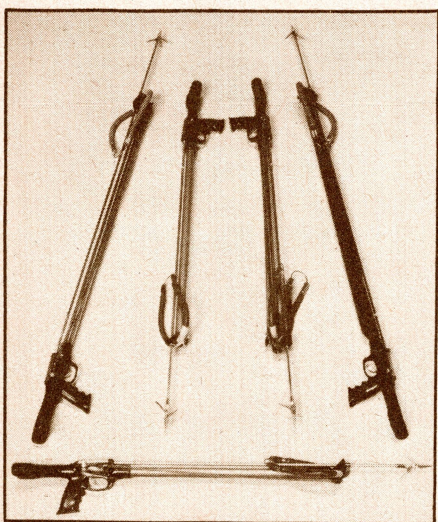


**TIME UNLIMITED, Dive Capsule**  
Quartz analog watch





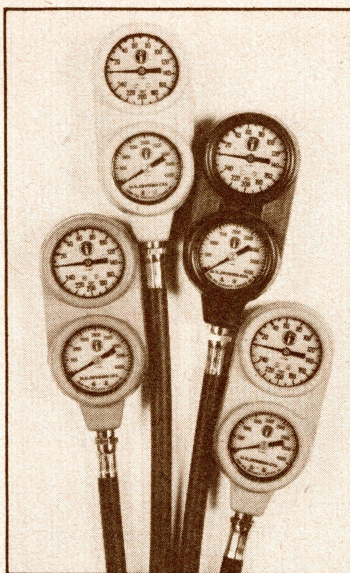
**TUFF TOTES, Dive Bags**  
Six colors, many different sizes



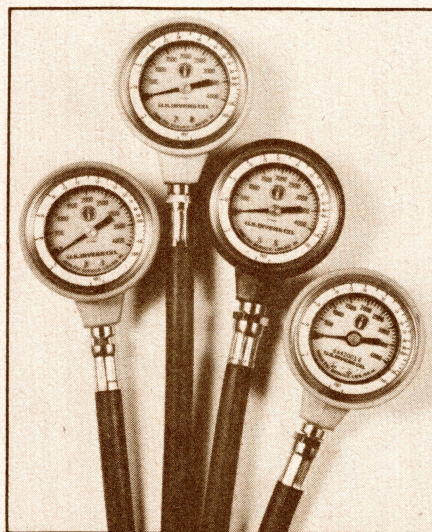
**UNDERSEA SPECIALISTS, Magnums**  
Individually hand crafted spearguns



**U.S. DIVERS, Aqua-Lung Pro Hood**  
One-quarter inch nylon-two



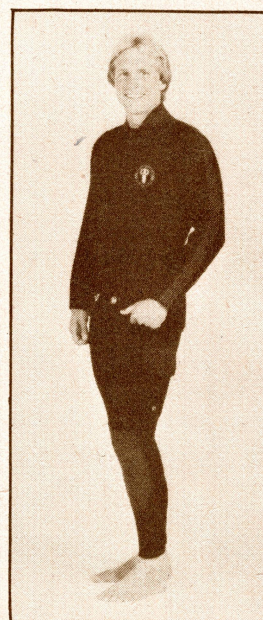
**U.S. DIVERS, Divemaster I**  
Conventional combo in colors



**U.S. DIVERS, Pro Dive II**  
Pressure, depth gauge in colorful boot



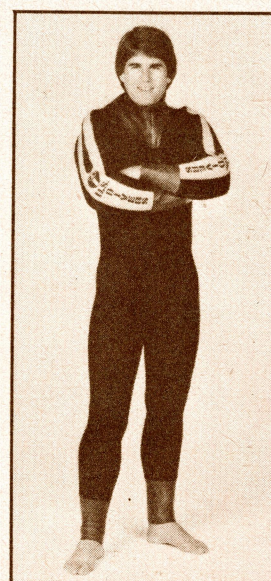
**U.S. DIVERS, Sea Diver II**  
Nylon-two, yellow or blue stripes



**U.S. DIVERS, Taskmaster II**  
One-quarter inch nylon-two,

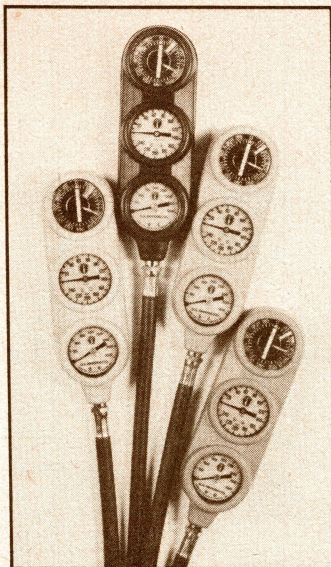


**U.S. DIVERS, Capri II**  
One-quarter inch nylon-two

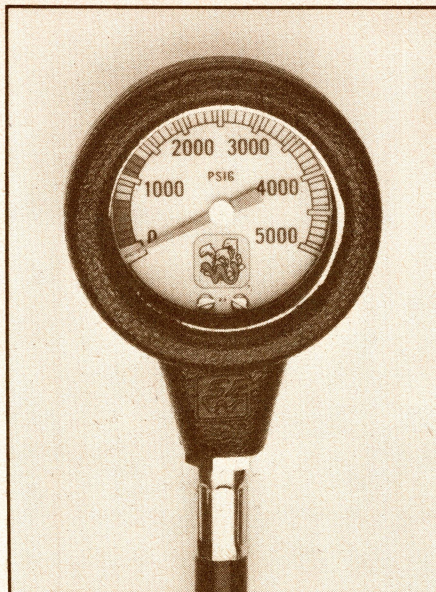


**U.S. DIVERS, Pro Drysuit**  
Nylon-two, one-piece suit

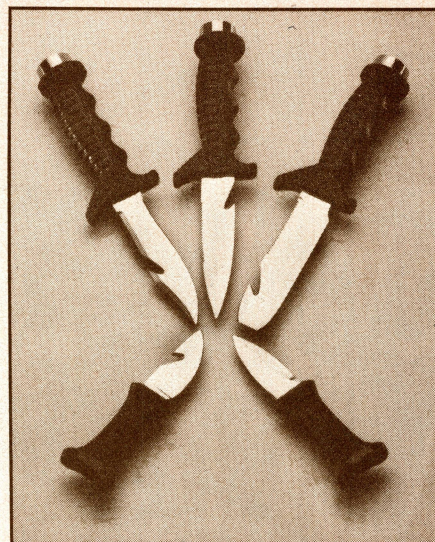




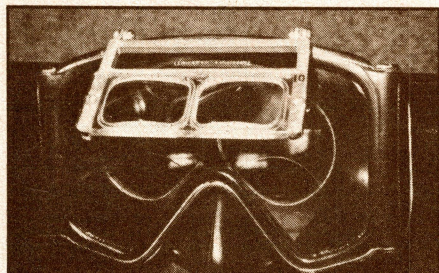
**U.S. DIVERS, Divemaster III  
SPG, depth gauge, compass**



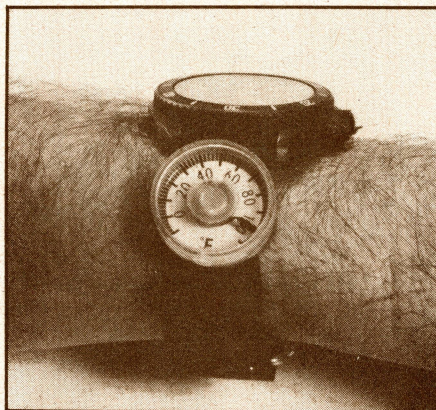
**WATERLUNG, 1408 SPG  
Solid brass housing**



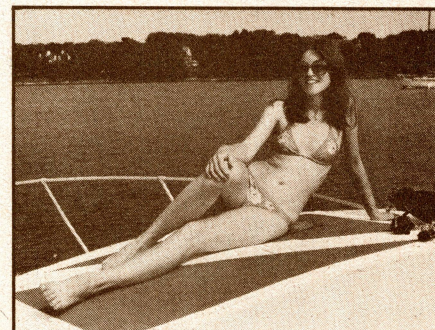
**WENOKA, Pro Divers Edge, Companions  
Smaller, stainless steel knives**



**VERNON OPTICAL, Prescription Lenses  
Bonded to the faceplate of your mask**



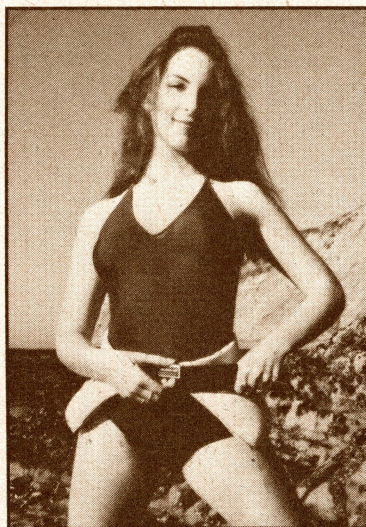
**WATERLUNG, Watchband Thermometer  
Large, easy-to-read luminous dial**



**WENOKA, Beach Towel  
Giant sheared velour, in red/white**



**WATERLUNG, 1420 Compass  
Luminous face, rotating bezel**



**WESSNER DESIGNS, Weightbelt  
Sand belts, velcro buckle**



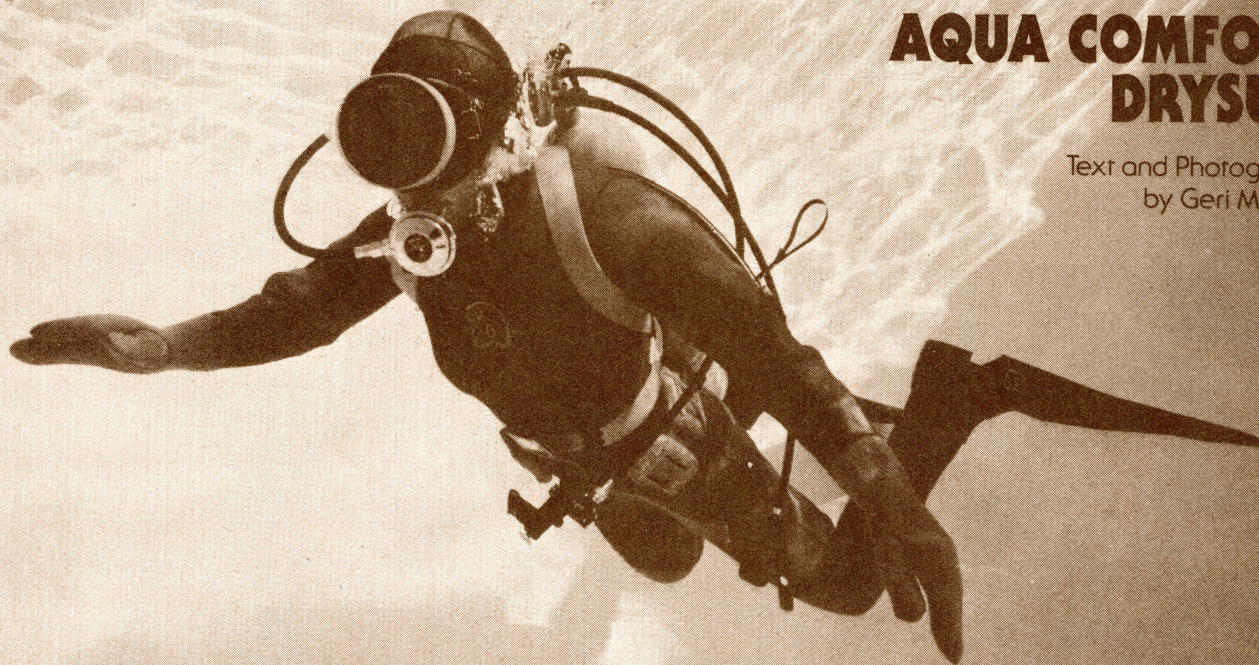
**WENOKA, Commemorative T-Shirts  
Available in all popular sizes**



# WARDELL

## AQUA COMFORT DRYSUIT

Text and Photography  
by Geri Murphy



**T**he Wardell drysuit is a good example of a highly specialized design which solves some of the classic problems of cold water diving. All suits are custom made to the individual and the result is a minimum amount of bulk and air movement within the suit.

Wardell Aqua Comfort Ltd. is a small manufacturer located on the Campbell River in British Columbia. It was established in January 1978 by a husband and wife team, David and Carol Wardell. Both have an extensive background in the dive shop business and Dave is a NAUI instructor. During their days in the dive shop business, Dave

and Carol realized that cold water divers were not experiencing the comfort and ease of diving which could be obtained with a high quality tailored drysuit. West Coast Canadian divers are faced with the challenge of diving in waters which range in temperature from 38°F to 50°F. Combining Dave's manufacturing experience with Carol's business knowledge, the couple decided to produce a suit which would keep divers more comfortable in these frigid waters. Hence, the birth of the Wardell drysuit.

Out of necessity, Wardell Aqua Comfort Ltd. was one of the few manufacturers that began with a drysuit concept.

The first two models produced were designed and tested by commercial divers before their introduction into the sport diving market. Both of these quickly won acceptance on the Canadian commercial market. In two short years Wardell's business tripled and it is continuing to grow at a rapid rate.

A perfectionist at heart, Dave Wardell chose a design that is more expensive to make but that offers the ultimate in drysuit reliability. Rather than cut a suit to obtain maximum utilization of a single sheet of neoprene, Wardell cuts a pattern which requires one and one-half sheets or more but eliminates many bothersome



seams, especially in the areas where there is a high risk of leaks. For example, there are no seams around the ankles, down the back of the legs or under the arms. Dave considers these critical areas of high flexibility — greater risk for seam tears.

The Wardell drysuit is built out of five basic pieces. The torso is made of two pieces joined on either side. The arms are one piece each, with a seam on top, and both legs are one piece with a seam on the side. Boots are permanently attached to ensure air-tight integrity and maximum warmth. Knee pads are standard for every suit and are sewn to the outside of the leg so they may be replaced when they wear out.

The neck seal is a tuck-in design and is installed at an angle (tilted slightly forward) consistent with the contours of the body. This slightly tilted design helps eliminate a good deal of air and water leakage. The neck seal is one-eighth inch neoprene; snug, but comfortable without a choking sensation. The wrist seals are conical and made of one-quarter inch nylon-one with the skin on the inside. The hood is not attached to the suit. It is one-quarter inch neoprene with a one-eighth inch face and neck seal to reduce water exchange.

The Wardell drysuit is made of top quality one-quarter inch nylon-two neoprene. Available colors include: blue, black and orange. At a slightly additional cost, the suit is also available in lycra, in light blue and navy blue with silver trim. Multiple colors can be used at no extra charge, since every Wardell drysuit is custom made.

Perhaps the most unique feature of the Wardell suit is the boot. Originally, a rigid boot was designed specifically for commercial diving use, where footwear must be extremely rugged and durable. Since most commercial divers do not wear fins, this boot was indeed the answer and the Wardell boot was unique because the interior is lined with foam neoprene.

The advantages of a rigid, hard sole boot are numerous. Such footwear will last for the lifetime of the suit because it will not puncture, tear, rip or wear. The roominess of a hard boot allows warm air to circulate around the foot and provides better insulation. Another advantage of this boot is its inflexibility. Air trapped in the boots or legs cannot form a bubble that will expand and the wearer's fins cannot be blown off his/her feet. The disadvantage of the boot is that it is very

large. It requires a fin with a giant foot pocket that can be found in only such fins as the Imperial Turtle. This type of boot is not for everyone, but it attracted so much attention among cold water sport divers that it led to the development of the vulcan boot.


The vulcan boot offers the best of two worlds by incorporating the desirable features of both the rigid and the soft boot. It is made of a durable, flexible rubber vulcanized onto a one-quarter inch neoprene bootie. This durable outer covering is puncture and wear resistant. It is a flexible, semi-rigid boot, pliable enough to be inserted into a fin pocket. But, it will not balloon outward from internal air pressure. The vulcan boot has become so popular that it is a standard part of the suit. The rigid boot and the soft boot are available optionally.

While Wardell Aqua Comfort Ltd. has grown rapidly, it is still a mom and pop operation. Dave Wardell regards suit construction and workmanship as his most important assets. Each Wardell drysuit is made by one person from start to finish. It is not passed along from table-to-table in assembly line fashion.

The Wardell drysuit has a clean, trim appearance. All sewn thread ends are tied and then melted to prevent unraveling. All seams are triple glued with both sides of the seam rolled. Each suit is personalized with a serial number. Every Wardell drysuit carries a one-year unconditional guarantee against material defects and workmanship. Warranty cards are included with each suit and purchase records are maintained at the factory.

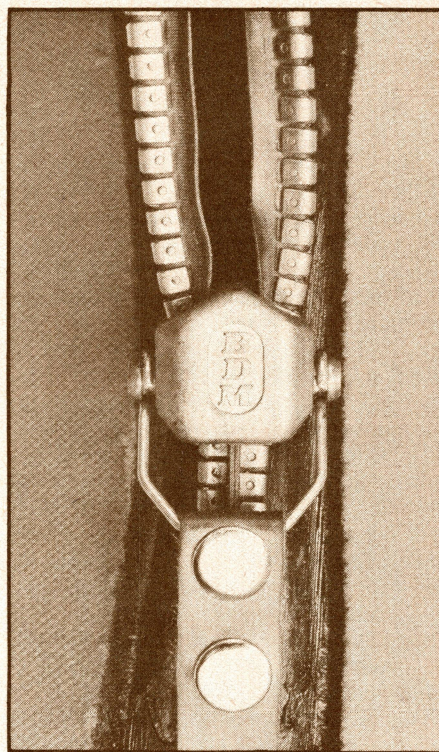
The Wardell drysuit comes with the hood, gloves, boots and oral/mechanical inflator for approximately \$540 (U.S.) \$665 (Canadian). Optional extras that would increase the basic cost of the suit include: rigid boots; soft boots with hard sole; lycra; convenience zipper; push button inflator.

Considering Dave Wardell's individualistic concepts for drysuit manufacturing, Wardell Aqua Comfort Ltd. may not ever become the General Motors of the drysuit business. Handcrafted products are almost a rarity in today's world of mass production, computerization and assembly lines. However, if you are looking for a well-made, high-quality drysuit with a unique, vulcanized boot, a Wardell import may be just the ticket.

For information write: Wardell Aqua Comfort Ltd., 1580 I. Willow St., Campbell River, B.C. Canada V9W 3M7. 



**The boot is a standard part of the Wardell drysuit. It comes in a rigid version for durability and a flexible version for comfort.**

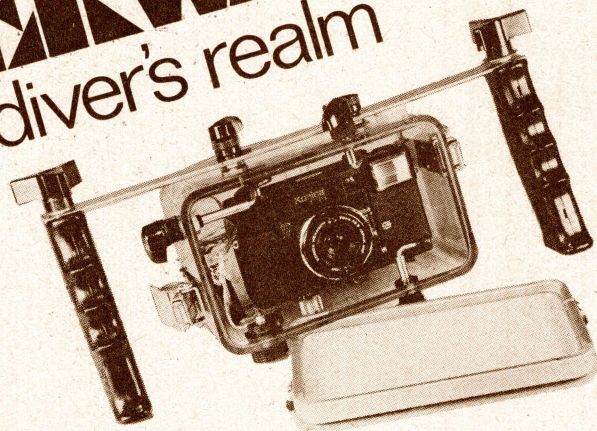


**Zippers are prime areas for leakage problems with drysuits. The Wardell suit has across the shoulder entry to reduce zipper area. The zipper is water-tight and heavy-duty.**



# AUTOFOCUS UNDERWATER?

Konica's  
Autofocus  
Camera tested in the diver's realm  
Text and Photography  
by Jim and Cathy Church



An autofocus system automatically measures the distance from camera to subject and focuses the lens for that distance. To determine if autofocus works underwater, we conducted several tests with the Konica Autofocus camera.

## THE BASIC FEATURES

The Konica C35AF is a compact 35mm camera with the following features:

The moderately wide-angle Hexanon 38mm lens has an aperture range of f2.8 to f22.

Both aperture and shutter speed are set automatically. The CdS exposure meter can be set for ASA 25-400.

The behind-the-lens shutter has three speeds: 1/60, 1/125 and 1/250 second.

The built-in electronic flash has an ASA 100 guide number of 45 for feet in air. The flash synchronizes with the shutter at any of the three shutter speeds. The flash aperture is automatically selected by the autofocus system.

## THE AUTOFOCUS SYSTEM

The C35AF features an electro-optical rangefinder for completely automatic focus control from 1.1m (3.3 feet) to infinity. With regular rangefinder cameras, you must manually adjust the focus control until two split images align in the viewfinder. With the Konica autofocus (which was developed by Honeywell), these images are aligned electronically.

An autofocus sensing area is marked in the center of the viewfinder; and covers about an 11 inch square at 6.5 feet. The autofocus system automatically sets the focus for whatever subject area is within this.

## TOPSIDE TEST

We began testing with above water exposures — both indoors and outside — with ASA 32 black and white film to minimize depth of field. As long as the subject area within the sensing area had details and contrast, the autofocus system worked. But if the subject within the sensing area was completely lacking in details and contrast — such as a smooth wall — the autofocus system could be fooled. The distance indicator on the camera showed that the focus was automatically set for either the minimum distance or infinity, and the pictures were out of focus. And if the sensing area completely missed the near subject, and saw only the distant background, the focus automatically adjusted for infinity.

## THE POOL TEST

Ikelite loaned us an U/W camera housing, and we proceeded to set up a pool test. We stayed with the ASA 32 film to minimize depth of field so focusing errors would be more apparent. Cathy posed several feet away from the side of the pool to simulate a midwater background. Jim took several shots with — and without — Cathy being centered in the autofocus sensing area shown in the viewfinder. The results were similar to those of the topside test: Whenever Cathy was in the sensing area, the pictures were properly focused. But whenever she wasn't, the pictures were out of focus. The plastic port of the camera housing didn't seem to have any effect on the focus.

## TURBID WATER TEST

Because our neighbor wouldn't allow us to dump mud in his pool, we per-

formed the turbid water test in Monterey Bay, California. With visibility about 12 or 15 feet, we shot 36 exposures on Ektachrome 64, and 36 more on Plus-X.


The autofocus needed details and/or contrast in the sensing area. When shooting upward diver silhouettes, for example, the autofocus worked wherever we placed the edge of the diver's silhouette in the sensing area. If aimed directly at the diver, the autofocus could be fooled.

In one sneaky test shot, we aimed upward at a large piece of seaweed floating in the foreground. The background was the floating canopy of kelp on the surface. We aimed the camera so both the detailed foreground and background would be partially in the sensing area. The autofocus correctly set the exposure for the seaweed in the foreground.

## BUILT-IN FLASH

Because the built-in electronic flash is located so close to the lens, it does cause backscatter from suspended particles in the water. And in several shots, reflections — the shape of the open lens aperture — appeared in the pictures. The flash is best used topside.

## CONCLUSION

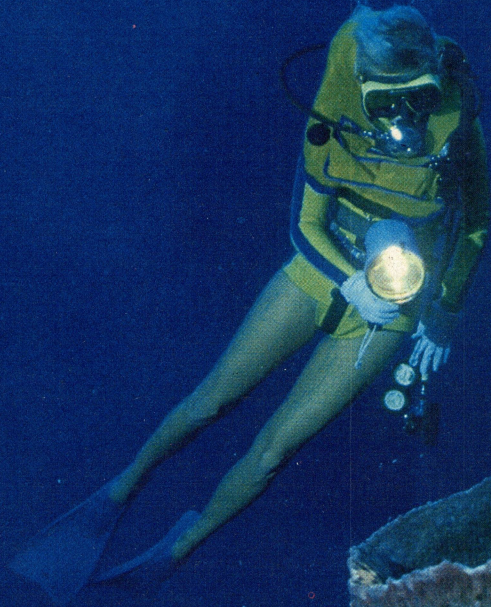
This autofocus system — which begins with the split images from two rangefinding mirrors — will work underwater. We believe that other systems working on the same basic principle should also work underwater. But systems which depend on an echo bouncing back from the subject to the camera, however, will probably be defeated by the housing port. As for the Konica C35AF, it is a good "aim and shoot" snapshot camera. 



# CAYMAN

a special guide to wall diving

By Paul J. Tzimoulis



skin diver magazine  
special supplement



# CAYMAN

If coral drop-offs were artistic masterpieces, the Cayman Islands would be a museum as famous as the Louvre. Nowhere in the Caribbean will you find a more remarkable collection of wall dives than among this cluster of tiny islands located in the center of the Caribbean.

In 20 years of traveling and diving the Cayman Islands I have heard stories and seen evidence of at least 200 different wall diving sites from the area encircling Grand Cayman, Cayman Brac and Little Cayman. And perhaps the most fascinating revelation is that no two wall dives are alike. Each drop-off is a living tapestry of magnificent corals, colorful sponges and a myriad of marine creatures. Each drop-off has some distinctive formation which makes it very special — each has almost an individual personality.

The following is but a small sampling of what the Cayman Islands have to offer. This collection of brief descriptions is representative, hopefully, of the incredible variety which awaits the visiting diver.

## GRAND CAYMAN

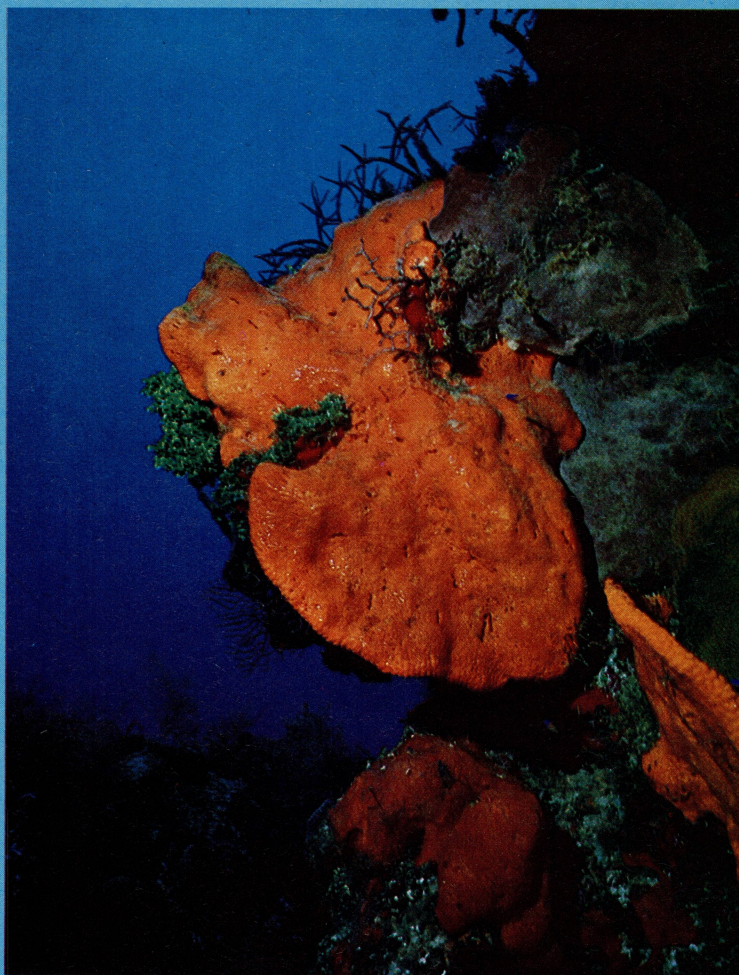
Grand Cayman is the largest of the three islands, measuring 22 miles in length and 8 miles at the widest point. It is shaped somewhat like a fat fishhook lying on its side. This island supports 90 percent of the country's population, but that number amounts to only 15,000 people.

Grand Cayman is a bustling island community with a booming condominium development program, a great deal of international banking, and a rapidly growing tourism industry. Last year, the island hosted almost 100,000 visitors.

Scuba diving is one of Grand Cayman's chief attractions and the island is one of the most popular vacation diving destinations in the Western hemisphere. Wall diving is available on all four sides of this island, as it is almost completely ringed by vertical drop-offs. In most areas, the drop-offs are only 200 to 400 yards from shore and readily accessible by short boat trips. To make things even more convenient, there are dive operators and hotels strategically located on all four sides of the island.

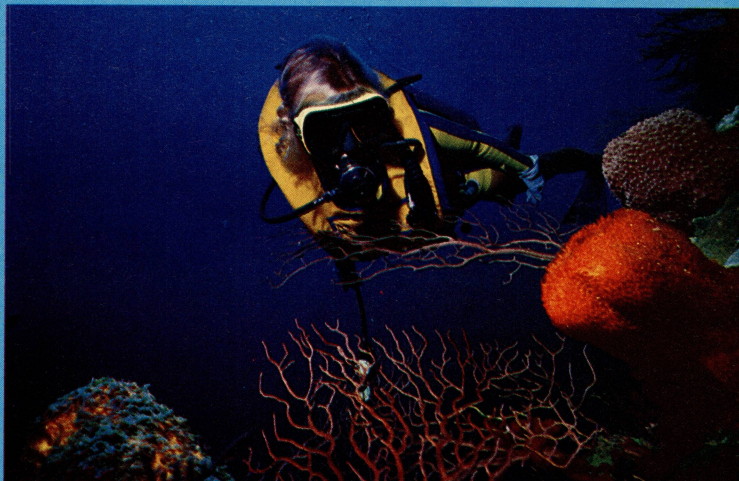
## WEST BAY

The west side of Grand Cayman is the hub of the island's tourism business — this is where you find the highest concentration of



Orange Canyon, West Bay, Grand Cayman

photos/Geri Murphy

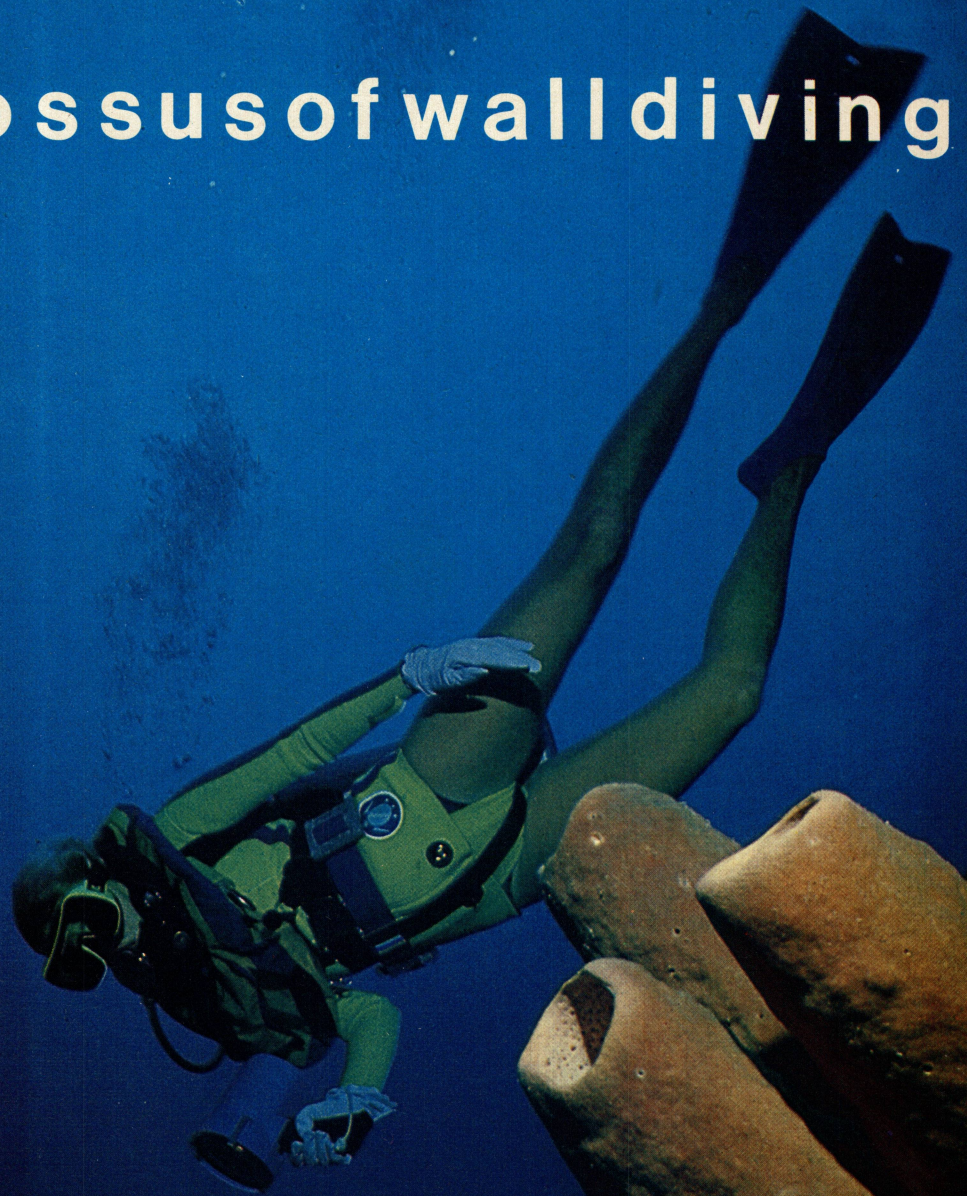


Vertical Wall, East End, Grand Cayman

photo/Paul J. Tzimoulis



# the colossus of wall diving



Pinnacle Rock, South Sound, Grand Cayman



Big Tunnel, West Bay, Grand Cayman



hotels and dive resort operators. Much of the activity centers around Seven Mile Beach which is Grand Cayman's hotel row. An absolutely stunning powder white sand beach curves in a slight arc for almost seven miles and provides the perfect playground for sun worshippers. It is along this beach that you find most of Grand Cayman's luxury hotels such as: the Cayman Holiday Inn, Galleon Beach Hotel, Royal Palm, Coral Caymanian, Beach Club Colony and Cayman Islander. Seven Mile Beach is on the leeward side of the island where the ocean is usually flat calm and the beach is filled with tourists who are sunbathing, swimming, and sailing. Sea conditions are so calm that the dive boats can drive right up on the sand, lower their bow ramps, and pick up dive guests right in front of their hotels. And, it is only 15 to 20 minutes by boat to some of Cayman's best-known wall dives.

**Big Tunnel** is an extremely impressive drop-off which features a giant coral archway at a depth of 120 feet. It is a sheer wall approximately 300 feet in length and carved by many winding channels and canyons. There is a large coral promontory at the south end and the coral archway is located at the north end.

The biggest thrill, of course, is to dive the archway. You approach this formation from the landward side and encounter the very top of the arch at 105 feet. It is immense in size, measuring at least 30 to 40 feet in diameter, and exits on the very face of the drop-off.

The interior of the archway is beautifully adorned with all types of sponge formations including: elephant ear sponges; tube sponges; basket sponges; and vase sponges. A row of black gorgonian fans lines the outer rim of the archway and some of these fans are four feet tall. The sand floor of the arch forms a funnel which continues on a downward slant to over 200 feet.

Visibility at Big Tunnel frequently exceeds 125 feet, and sometimes reaches a maximum of 200 feet. On a good day, you can actually see all the way through the archway while snorkeling on the surface! It is not unusual to encounter a school of horse-eye jacks cruising along the outside edge or perhaps swimming down through it. There is also a four foot barracuda who likes to hang just outside the arch.

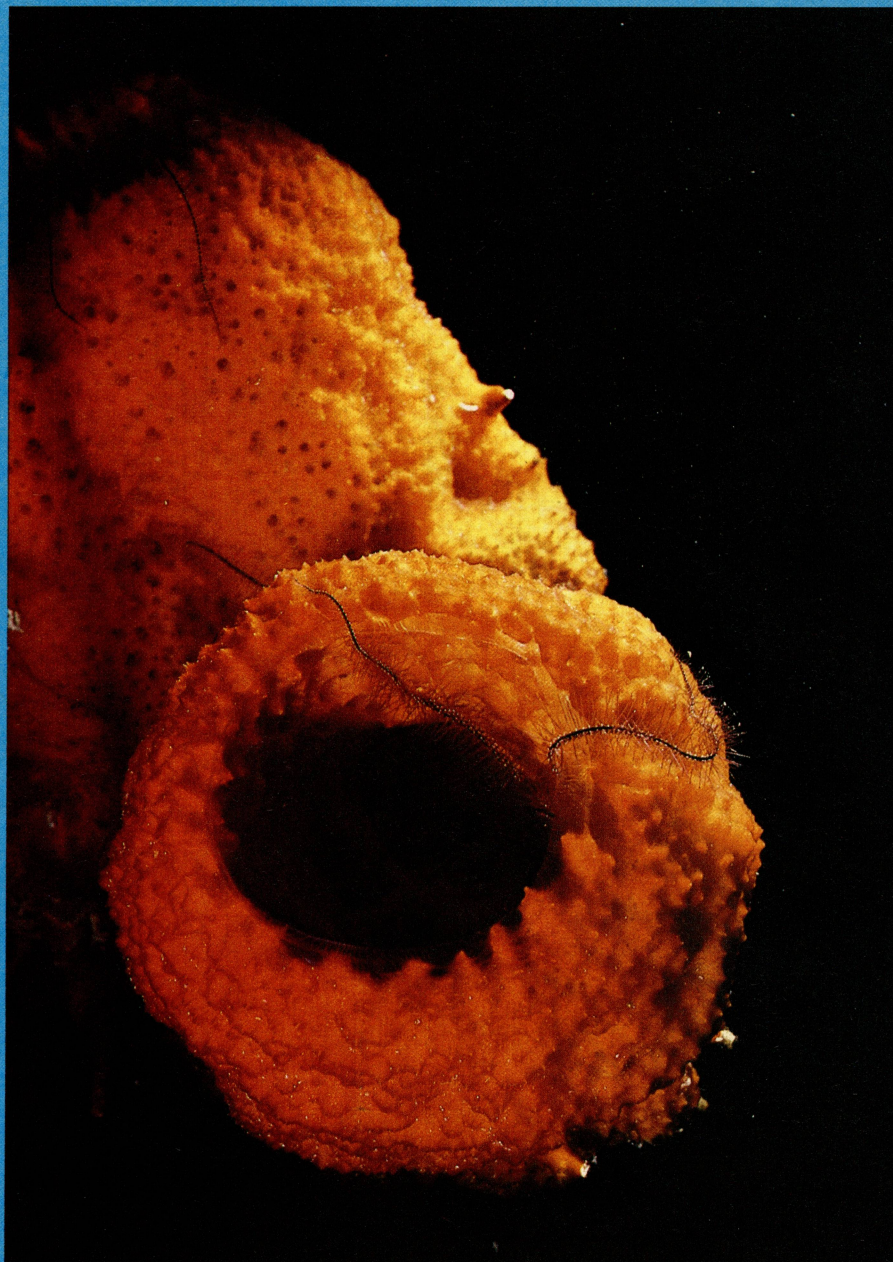
**Big Dipper** is another drop-off — just south of Big Tunnel, which offers vertical wall diving and a multitude of unusual submarine formations. The top of the wall begins at 55 feet, where a large coral rampart juts out from the face of the wall and helps to form a small coral valley. This drop-off takes its name from a gigantic basket sponge which is found at 105 feet. The sponge is located in the

coral valley and is surrounded by black gorgonian fans and many hard coral formations. This unusual basket sponge is at least six and one-half feet tall. It is large enough to hold at least three or four scuba divers and makes an excellent subject for underwater photography.

**Orange Canyon** is an unusual formation formed by a giant coral head which sits in the center of a split canyon formation. The south side of the vertical canyon wall is lined with orange elephant ear sponge formations. This wall of orange sponges stretches for a distance of 60 feet and rises up almost 40 feet from the canyon floor. Growing among the orange sponges is also a forest of black gorgonian fans. The top of the reef is only 50 feet deep, but the best diving is to be found at approximately 75 feet, where the orange

sponges are more numerous. Orange Canyon is also an excellent location for fish photography — there are a number of Nassau groupers and tiger groupers who visit cleaning stations in this area.

**Trinity Caves** is perhaps the most popular and best-known wall dive in Grand Cayman. The name is somewhat of a misnomer as the caves are actually long narrow coral canyons which eventually turn into tunnels as they approach the edge of the drop-off. There are a total of four coral tunnels in this area which provide a fascinating deep sea trail into the coral wilderness. There are two comparatively long tunnels which run almost parallel to each other. They begin in approximately 60 feet and slope gradually downward to 100 feet where they exit together on the face of the wall. Just south



Above, one of Cayman's brilliant orange sponges. Right, Cayman Canyons, East End of Grand Cayman.

photos/Geri Murphy







of the twin tunnels is a slightly shorter and more meandering tunnel, which also leads to the drop-off, but which exits into a deep coral crevice directly in front of a towering pinnacle. Just to the right of this tunnel's exit is another much shorter tunnel which curves in U-shape fashion around a second coral pinnacle.

Trinity Caves is not only distinctive for its coral tunnels but also because these passages are loaded with black coral. Much of it grows along the walls and floor of the passageways as well as on the outside face of the drop-off. In addition to the black coral trees, Trinity is studded with a marvelous array of big sponges in every imaginable shape. There are baskets, tubes, earlobes, vases, platters and at least a dozen more forms. As you ascend along the outside face of this drop-off you will see a number of giant basket sponges and barrel sponges. The upper portion of the wall is covered with bushy black gorgonian fans which stand three to four feet tall.

**Sand Chute** is a giant sand river which slopes gradually to the edge of a vertical drop-off located one-half mile south of Trinity Caves. The top of this funnel-shaped ravine begins in 60 feet where the giant river of sand is almost 300 feet wide. It slopes on a gradual incline to a depth of 120 feet, where the sand flow has narrowed to a width of 30 feet. At this point, the slope becomes steeper and slants to a 45 degree angle and continues to plunge to more than 350 feet. As you swim down this sand river you are reminded of a snow ski run.

Rising up from both sides of the sand river are towering mountains of coral. These formations are at least 100 feet long and rise up 60 feet with almost vertical sides.

The most unique feature of this drop-off is a monstrous barrel sponge growing out from the south wall at 100 feet. This mammoth sponge is eight to nine feet tall and perhaps six feet in diameter. It is reputed to be the largest barrel sponge in the Caribbean, and I have yet to find another that comes even close to the size of this monster. The mouth of the sponge is approximately four feet in diameter and the overall color is a pinkish-gray. This sponge is especially impressive because it grows straight out from the side of the coral wall and becomes the dominant feature of the entire area, almost dwarfing everything else around it.

Just above the giant barrel sponge is a slightly smaller basket sponge at 90 feet. It is perhaps five feet tall and six feet in diameter but looks tiny compared to its big brother. The entire wall bordering the chute is loaded with all types of sponges, including many of the crimson red sponges which are sometimes called blood sponges. These unusual sponges can be found between 100 and 120 feet.

Sand Chute also offers an opportunity for experiencing some pretty good fish action. There is a school of 25 horse-eye jacks which hang around this area regularly and can often be seen swimming over the river of sand. Several Cayman dive guides have reported seeing a 300 pound jewfish that measures five feet in length and seems to frequent the Sand Chute area.

### SOUTH SOUND

There is an interesting series of drop-offs located off the southwest end of Grand Cayman directly out from an area known as South Sound. There are perhaps 10 or 12 documented wall diving sites along a five mile stretch of shoreline running from the southwest point to Spotts Bay. These reefs are not nearly as well-known as the West Bay drop-offs; they are only used on a regular basis by a few dive guides.

Most of the Seven Mile Beach operators find the South Sound drop-offs too far for a normal daily run. They are only used during those infrequent occasions when the normal trade winds swing around and begin blowing out of the northwest. On such occasions, the drop-offs at South Sound often become glassy calm and ideal for daily trips out of the South Sound storm anchorage.

Under normal conditions, the drop-offs along South Sound are often subject to ocean swells and perhaps a windy surface chop. There is also a good deal of current which often occurs along these sites. However, these slightly harsher dive conditions are rewarded by a number of exciting experiences; the South Sound drop-offs are indeed different.

**Bonnie's Wall** is located directly out from the wreck of the *Palace*. It is a deep wall which begins at 70 feet and drops vertically into the inky blue. The top of the wall is a series of gradually curving hills and valleys, which continue for more than one-quarter mile along the edge. While

some parts of the drop-off are slightly sloping, certain ridges turn into sharply faced ramparts that shear off abruptly. Giant black gorgonian fans can be found along the very edge of these ramparts, with some fans reaching a height of six feet. They make exceptionally beautiful pictures when back-lit by the sun. Visibility along this wall ranges from 120 feet to 180 feet.

**Pinnacle Rock** is an extremely unusual pillar coral formation which measures 80 feet tall and 35 feet in diameter. When first seen underwater, it bears a striking resemblance to the leaning

Tower of Pisa, except it is not leaning.

This drop-off begins at approximately 70 feet with the top edge of the wall forming a series of ridges and valleys. One particular valley turns into a narrowing funnel of sand. The sides of this ravine grow steeper as the sand floor slopes from 80 to 150 feet. At the narrow end, the ravine is perhaps 60 feet wide with coral walls rising vertically on both sides.

Precisely in the center of the sand ravine stands one giant coral pinnacle. It is cylindrical in shape and rises up at least 80 feet from the floor of the ravine. The top of the pinnacle is flat and slightly overgrown, giving the pinnacle an almost mushroom-like appearance. This very tall pillar is perched on the very edge of the drop-off, right where the sand ravine spills over.

It seems as if every square inch of this unusual formation is covered with hard corals, soft gorgonians, deep seafans, colorful sponges and slender seaweeds. Swimming around the pillar in a spiral motion, one can observe clusters of large brown tube sponges, crimson red vase sponges, electric pink vase sponges, brilliant yellow gorgonian fans, orange cup sponges, and perhaps a dozen other exotic forms of marine life. The pillar is crammed with marine life that will excite even the most seasoned wall diver.

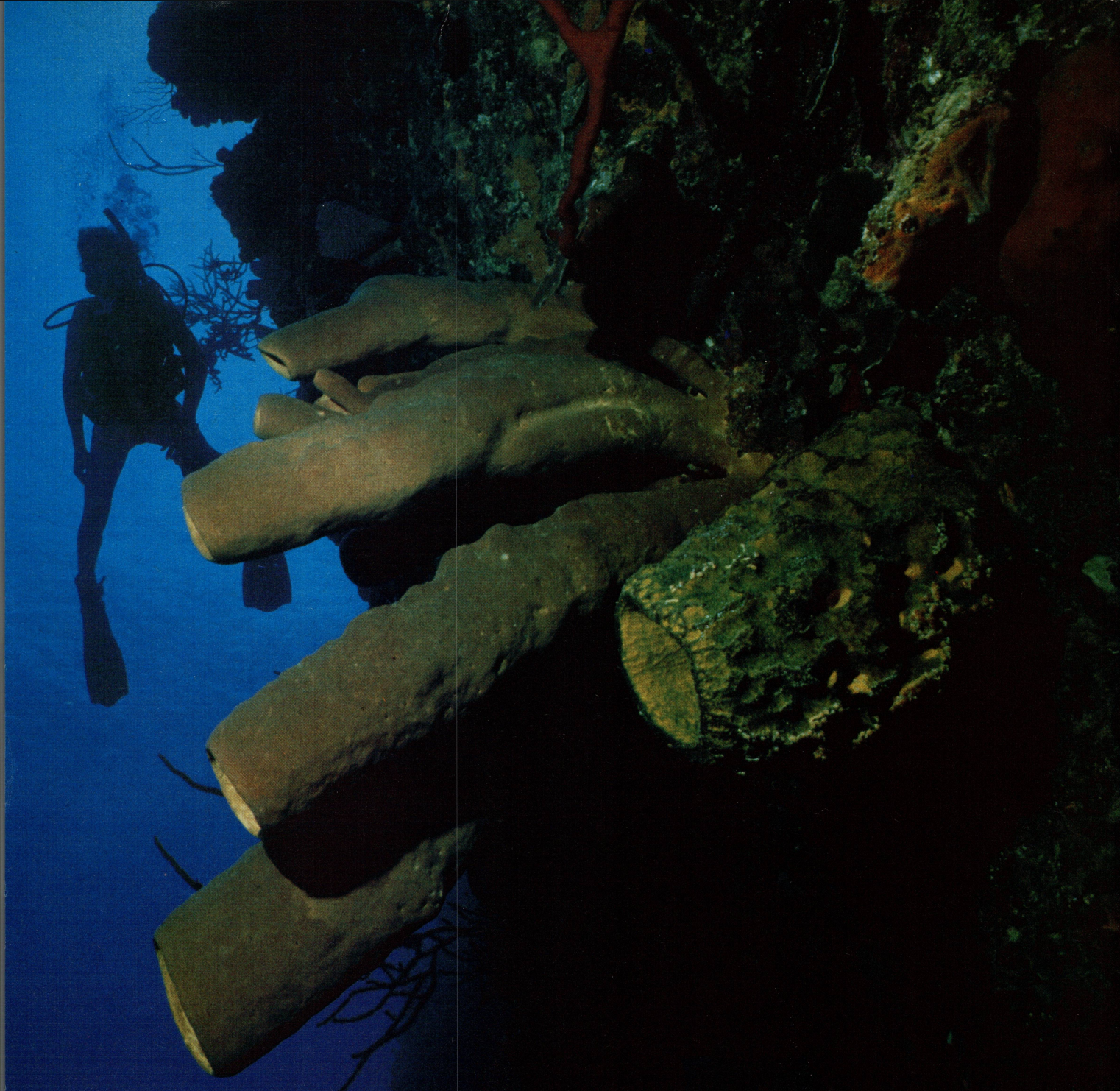
Adjacent to the coral pinnacle are the two vertical walls which form the sides of the ravine. They are less than 50 feet away and help to form a shield from the current which flows along the south wall. The side walls are equally loaded with marine life but do not have the exotic variety found on the Pinnacle Rock.

**Eagle Ray Rock** is a very beautiful wall dive which is not on the South Sound side, but instead just around the corner of the southwest point on the western side. It is in the same general area and visited by dive operators who frequent South Sound. This location was named after the many elegant eagle rays which

are frequently seen cruising along this section of the drop-off. The top of the wall begins at 55 feet and drops vertically. There is an interesting L-shaped ravine formed by a high coral promontory with vertical sides. The walls of this canyon are loaded with all types of colorful sponges, black coral trees, and deep seafans. It is an absolutely lovely dive and a perfect place for underwater photography.

Situated close to Eagle Ray Rock and the drop-offs of South Sound are two very popular diver hotels. The Sunset House and the Casa Bertmar Resort are both lo-





**Bloody Bay, Little Cayman.**

photo/Geri Murphy

cated close to the southwest corner of Grand Cayman, just south of George Town. Both hotels cater specifically to divers and both operate daily boat trips to the reefs off West Bay as well as those directly out from South Sound.

#### **EAST END**

There is a giant crescent-shaped barrier reef located off the East End of Grand Cayman, and beyond the surf line of this shallow coral barrier lies some of the most exciting drop-offs to be found anywhere on Grand Cayman. It is a fabulously rich area with massive coral formations

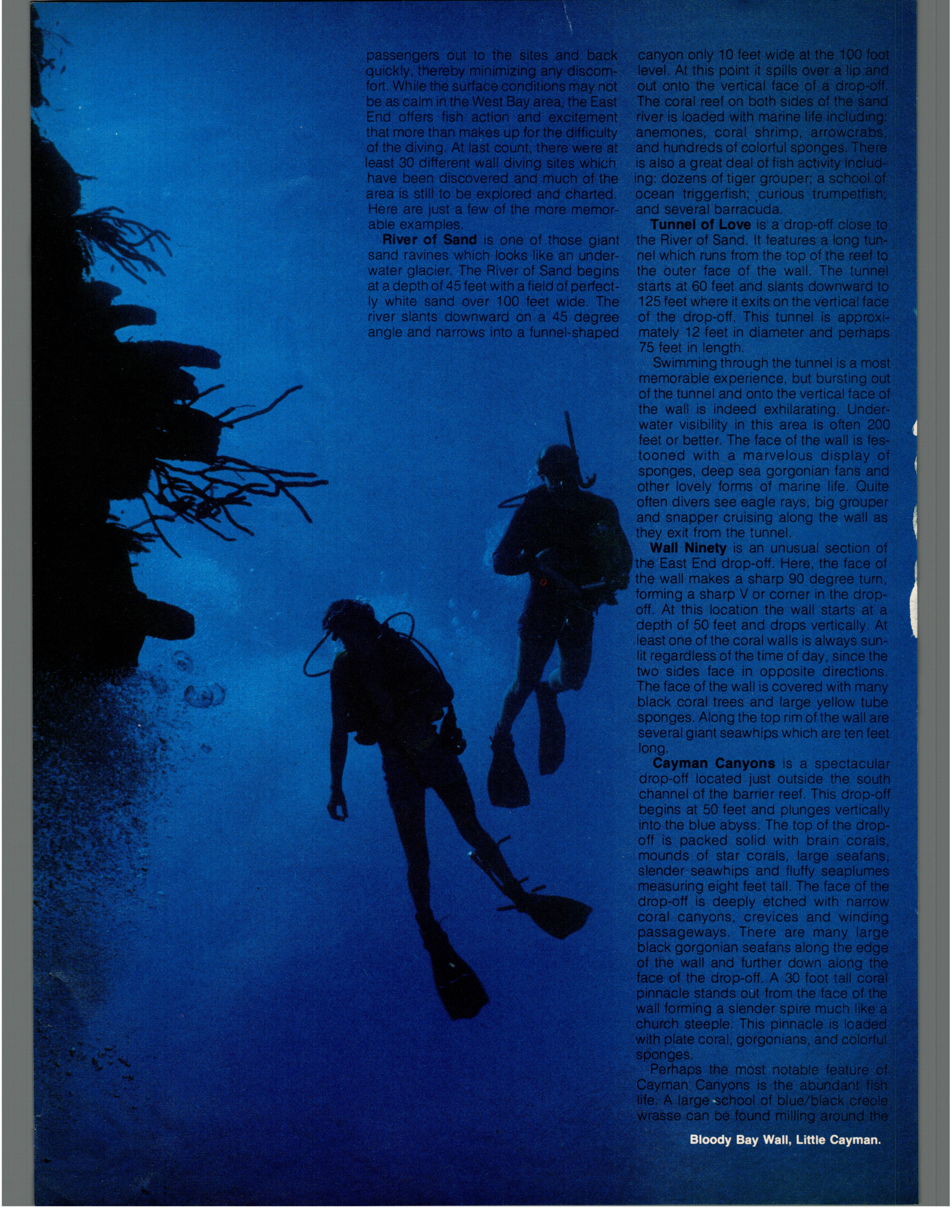
and a great deal of big fish action.

The East End drop-offs are not well known to most Cayman visitors because of their remote location of 25 miles from George Town. These reefs are not dived by the operators along Seven Mile Beach and visitors must therefore journey to the opposite end of the island to experience unique adventure. Fortunately, there are two hotels located at the East End, and both offer daily dive trips to the offshore walls. The Tortuga Club is a small, but lovely, beach hotel which caters to honeymooners, sun lovers, and vacationers who seek privacy. This hotel

also has a complete dive shop and offers daily boat trips to the reef. The Cayman Diving Lodge is a newly renovated resort catering specifically to experienced divers. Owned and operated by two professional underwater cinematographers, this lodge is designed and run for the diver's every need. Both hotels utilize a wide selection of wall diving sites along the outside of the East End barrier reef.

While the East End is indeed the windward side of Grand Cayman it is not too rough for diving. The dive boats used in this region are deep V-hulls with fast engines. The dive operators can get their





passengers out to the sites and back quickly, thereby minimizing any discomfort. While the surface conditions may not be as calm in the West Bay area, the East End offers fish action and excitement that more than makes up for the difficulty of the diving. At last count, there were at least 30 different wall diving sites which have been discovered and much of the area is still to be explored and charted. Here are just a few of the more memorable examples.

**River of Sand** is one of those giant sand ravines which looks like an underwater glacier. The River of Sand begins at a depth of 45 feet with a field of perfectly white sand over 100 feet wide. The river slants downward on a 45 degree angle and narrows into a funnel-shaped

canyon only 10 feet wide at the 100 foot level. At this point it spills over a lip and out onto the vertical face of a drop-off. The coral reef on both sides of the sand river is loaded with marine life including: anemones, coral shrimp, arrowcrabs, and hundreds of colorful sponges. There is also a great deal of fish activity including: dozens of tiger grouper; a school of ocean triggerfish; curious trumpetfish; and several barracuda.

**Tunnel of Love** is a drop-off close to the River of Sand. It features a long tunnel which runs from the top of the reef to the outer face of the wall. The tunnel starts at 60 feet and slants downward to 125 feet where it exits on the vertical face of the drop-off. This tunnel is approximately 12 feet in diameter and perhaps 75 feet in length.

Swimming through the tunnel is a most memorable experience, but bursting out of the tunnel and onto the vertical face of the wall is indeed exhilarating. Underwater visibility in this area is often 200 feet or better. The face of the wall is festooned with a marvelous display of sponges, deep sea gorgonian fans and other lovely forms of marine life. Quite often divers see eagle rays, big grouper and snapper cruising along the wall as they exit from the tunnel.

**Wall Ninety** is an unusual section of the East End drop-off. Here, the face of the wall makes a sharp 90 degree turn, forming a sharp V or corner in the drop-off. At this location the wall starts at a depth of 50 feet and drops vertically. At least one of the coral walls is always sunlit regardless of the time of day, since the two sides face in opposite directions. The face of the wall is covered with many black coral trees and large yellow tube sponges. Along the top rim of the wall are several giant seawhips which are ten feet long.

**Cayman Canyons** is a spectacular drop-off located just outside the south channel of the barrier reef. This drop-off begins at 50 feet and plunges vertically into the blue abyss. The top of the drop-off is packed solid with brain corals, mounds of star corals, large seafans, slender seawhips and fluffy seaplumes measuring eight feet tall. The face of the drop-off is deeply etched with narrow coral canyons, crevices and winding passageways. There are many large black gorgonian seafans along the edge of the wall and further down along the face of the drop-off. A 30 foot tall coral pinnacle stands out from the face of the wall forming a slender spire much like a church steeple. This pinnacle is loaded with plate coral, gorgonians, and colorful sponges.

Perhaps the most notable feature of Cayman Canyons is the abundant fish life. A large school of blue/black creole wrasse can be found milling around the

**Bloody Bay Wall, Little Cayman.**



top of the drop-off between 50 and 70 feet. A school of blue runner jacks frequently cruises along the face of the wall at the 100 foot mark. There are also many large Nassau and tiger grouper which hang among the small coral heads and crevices. On a number of occasions, the dive guides have reported seeing black tip and white tip sharks in this area, but these creatures never make a menacing move toward the divers. There is also a pet barracuda which hangs just above the lip of the drop-off as though guarding the reef.

**The Maze** is a most remarkable drop-off featuring an intricate series of inter-connecting coral canyons which are very narrow and quite deep. The top of this drop-off begins at 55 feet and the top of the wall is a chain of mountainous coral hills. These hills are segmented by a number of very narrow winding crevices, barely wide enough for one diver to pass. Some of these canyons are 60 to 80 feet deep and more than 100 feet long. They seem to meander in aimless directions, with many canyons connecting to others. The walls of these narrow passageways are often lined with black coral trees, deep sea gorgonian fans and tube sponges. One visitor described this unusual coral maze as resembling the streets and skyscrapers of New York City.

Most of the coral canyons empty out onto the vertical face of the drop-off. There are many excellent macro photography subjects here, including: bright red wire coral with snow white polyps; green finger sponges with brilliant yellow anemones; and black gorgonian fans with snow white polyps. The colors of the sponges in this area are also unusual. For example, there is a creamy white vase sponge with a red rim, a lime green tube sponge which is almost fluorescent and several pink vase sponges which are heart-shaped.

The fish action in this area is equally spectacular. On one dive, the divemaster from the Cayman Diving Lodge sighted a 600 pound green turtle measuring five feet in length. This site is also well-known for a giant southern stingray that lives at the top of the wall. He measures eight feet from wingtip-to-wingtip, and is an estimated 12 feet long from nose to tail. This giant is usually found browsing in a sand patch near the edge of the water.

**Vertical Drop** is an extremely impressive wall dive with visibility generally running 200 feet or better. The top of the wall begins at 50 feet, and consists of a series of immense coral mounds with sand ravines in between. One ravine, called Big Valley, runs for more than 300 feet and has sloping sides paved with living corals. The floor of the ravine is covered with pure white sand and slopes downward on a 45 degree angle. At 160 feet the sand ravine funnels down to a

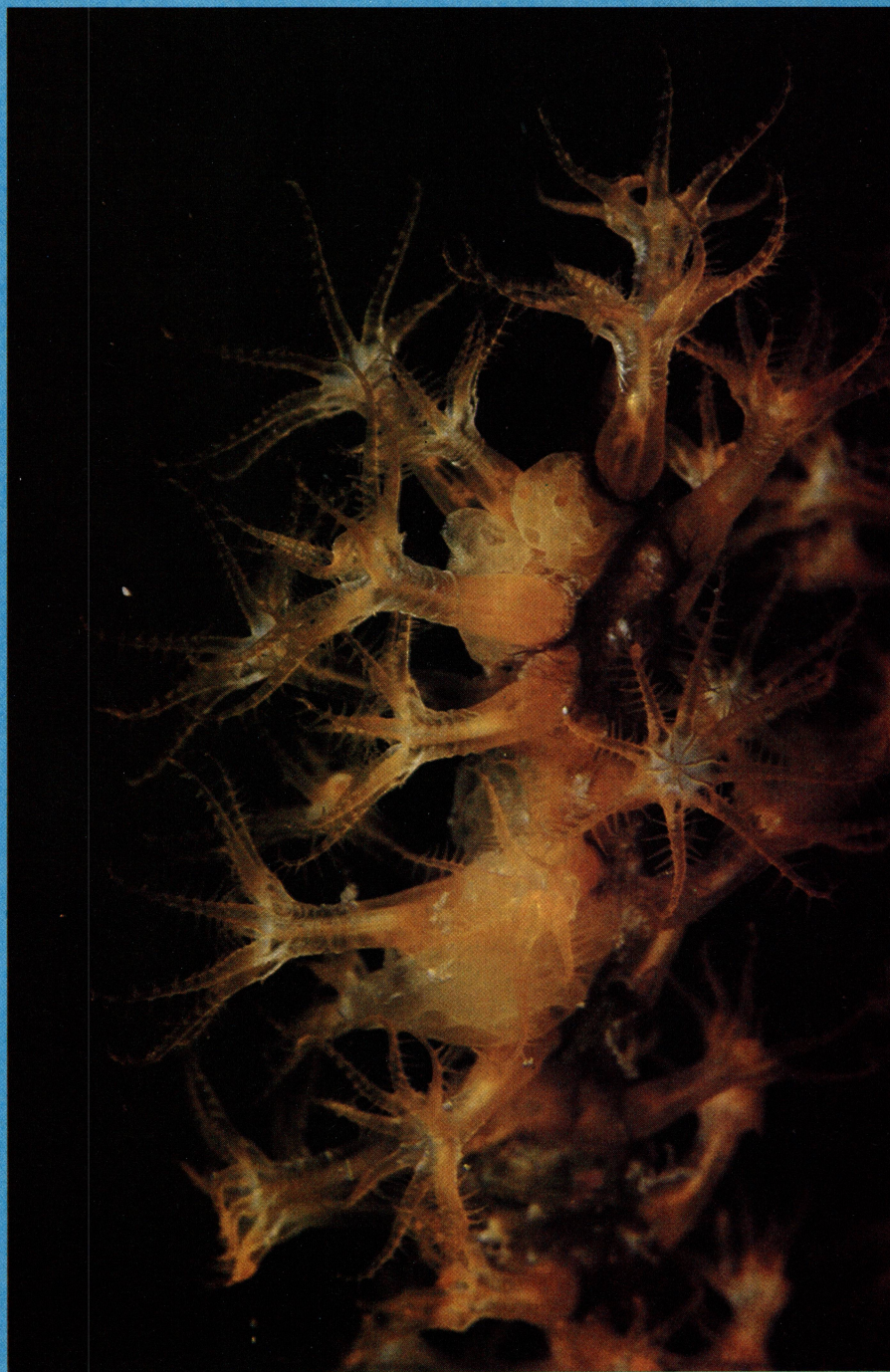
three foot wide neck and then spills over the lip of a vertical drop-off.

The superb underwater visibility provides an awesome view of this coral drop-off. The slopes of the surrounding coral hills are tightly packed with brain corals, star corals and shelving plate coral. Everything on this reef seems to grow to gigantic proportions. Seawhips are 10 feet tall, brain corals are six feet across and shelving plate corals are as big as pizza pies.

Vertical Drop is also notable for its fish life. Nassau and tiger groupers can be seen in abundance in sizes ranging from 20 to 40 pounds. Divers often see a 250 pound jewfish at a cleaning station in the sand channel. Other regular visitors in-

clude: eagle rays, stingrays, manta rays, sharks, jacks, tuna and sometimes dolphin.

**The Chimney** is still another vertical drop-off which features an unusual tunnel formation. The top of this wall starts at 50 feet and drops vertically into the blue. At a depth of 135 feet, there is an entrance to a small tunnel on the vertical face of the wall. The opening is approximately 7 feet in diameter and the tunnel goes horizontally into the reef for at least 40 feet. At this point, the tunnel makes an abrupt 90-degree turn and ascends upward in a vertical shaft. The vertical tunnel or chimney travels upward 70 feet and emerges at the top of the reef close to the edge of the drop-off. Although the



Gorgonian coral polyps extended in feeding.

photos/Geri Murphy





**Grouper Point, North Sound, Grand Cayman.**

photo/Jim & Cathy Church

interior of the tunnel does not offer much in the way of marine life, it is indeed a fascinating experience.

#### **NORTH WALL**

The drop-offs located along the north shore of Grand Cayman from Conch Point to Rum Point are reputed to be the finest on Grand Cayman. Whether they are equal to, or better than, the East End drop-offs still remains to be seen: Few divers have yet had ample opportunity for comparison. Perhaps the North Wall drop-offs are more famous because they are frequently used by the dive operators

along Seven Mile Beach. One thing is certain however, the North Wall drop-offs are indeed stunning and offer many opportunities for exciting dive adventures.

At present, there is only one hotel operating on the north shore of Grand Cayman. Cayman Kai Resort is a large country club style hotel which offers sailing, swimming, fishing, tennis and of course scuba diving. The operator at this resort is the only dive guide who conducts daily trips to North Wall drop-offs. Cayman Kai is also the only dive operator that visits the wall diving sites which lie east of the hotel, just off the town of Northside. The

only other dive operator visiting these remote locations is the cruise ship, *M/V Cayman Diver* which makes a weekly tour around the entire island.

Dive operators from the Seven Mile Beach area frequently make a weekly all-day dive trip up around the northwest point, visiting the drop-offs along the western edge of North Sound. The North Wall drop-offs stretch along a ten mile section of reef, running from Conch Point to Northside.

**Neptune's Gallery** is a lovely drop-off located two miles east of Cayman Kai Resort. Its main feature is a deep narrow



canyon which cuts through the top of the reef and exits onto the vertical face of the drop-off. The top begins at 60 feet, where one discovers a long narrow crack measuring three feet in width. Descending into the narrow crevice one encounters a deep but narrow coral canyon. The walls are 50 feet high and the floor of this passageway is paved with pure white sand. The canyon winds around several corners and zig-zags its way toward the edge of the drop-off. The coral reef above has actually grown together forming a narrow winding tunnel. The walls of the canyon are adorned with green and red finger sponges, small basket sponges, gorgonian fans and black coral trees. Near the end, the canyon splits into two separate passageways with a large coral formation in the center.

The canyon eventually opens onto the face of a vertical wall at 120 feet. Underwater visibility in this area frequently reaches 100 feet or better. The best part of the dive is swimming out of the canyon and into the inky blue water of the drop-off. The outer face of this wall is loaded with lovely corals, giant fans and sponges of all kinds. In some places there are deeply carved undercuts which reach back under the wall eight to ten feet. The marine life growing from these undercuts is a delicious array of exotic colors.

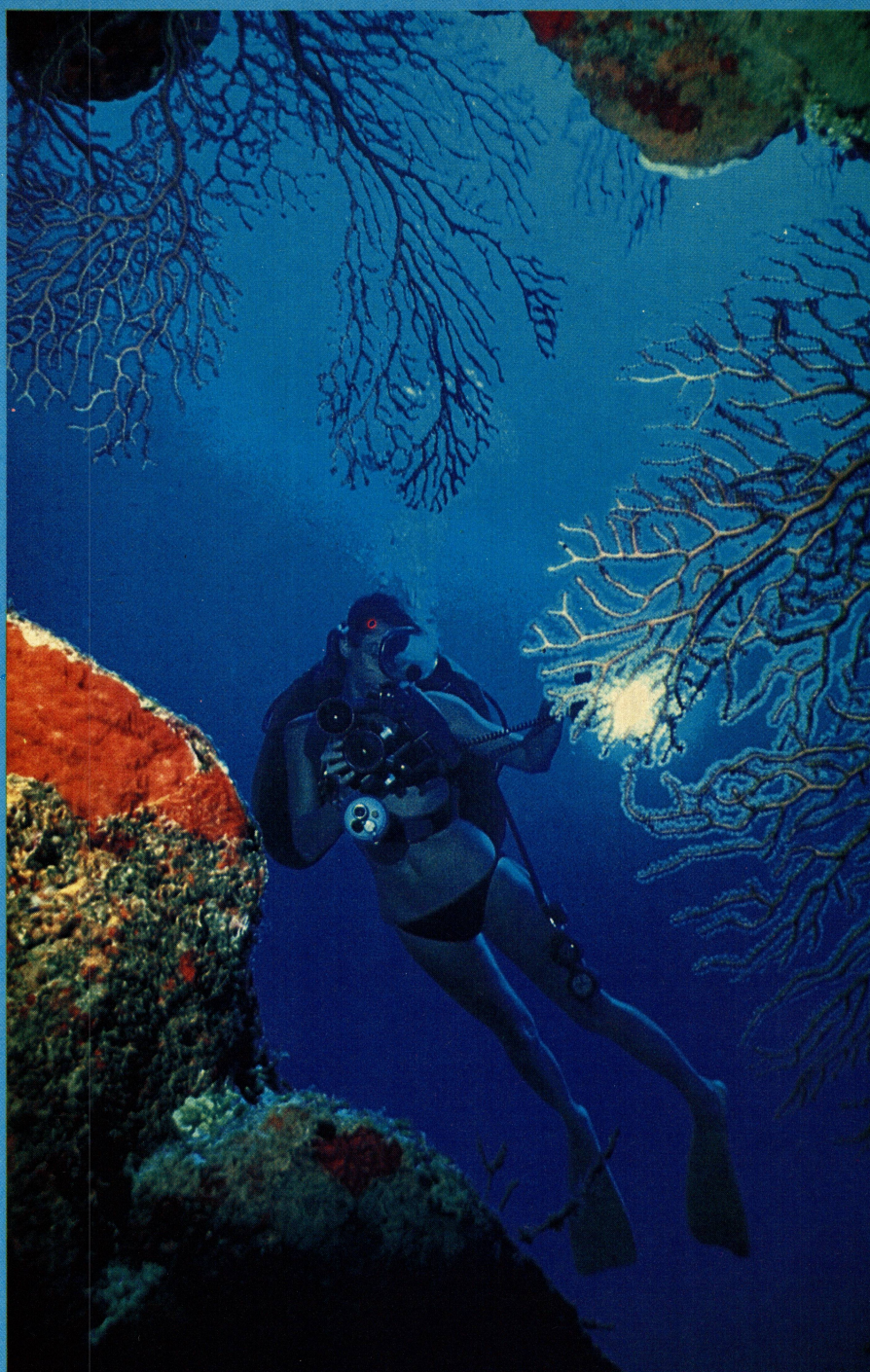
**Northside Chute** is a vertical drop-off which begins at 80 feet. The main feature of this dive site is a vertical tunnel eight feet in diameter. It begins on the top of the drop-off and drops vertically for at least 25 feet before making a right angle turn and exiting on the face of the wall at 120 feet. This wall is covered with black coral and absolutely beautiful sponges.

**No Name Wall** is located straight out from Rum Point Channel and is dived frequently by the guides at Cayman Kai. For a dive site without a name, this location is a pretty popular drop-off. Perhaps the lack of a specific name adds to the mysterious lure which has attracted more than one curious diver.

The top of the drop-off begins at a depth of 55 feet with a sharply sloping wall. The upper edge is uniquely marked by a series of four parallel coral ravines. They begin at 55 feet and slope to 90 feet where they go over the edge of the wall.

One of the main attractions of No Name Wall is an unusually large crimson red sponge growing out from the vertical face of the drop-off at a depth of 120 feet. This sponge is the shape of a basket, 18 inches in diameter and two feet tall. It grows out from the wall at an almost horizontal angle. It is an absolutely sensational subject for the underwater photographer who is seeking brilliant color. Underwater visibility on this drop-off ranges from 150 to 175 feet.

**Grand Canyon** is a breathtaking coral wall formation which almost defies de-



**Gale's Mountain, North Sound, Grand Cayman.**  
photo/Nancy Sefton

scription. The immense dimension of this formation literally dwarfs the diver and vividly portrays the grandeur of the North Wall drop-offs.

Two giant coral ramparts jut outward from the vertical wall creating a yawning chasm of clear blue water in between. It is approximately 150 feet from the point of one rampart to the point of the other, and the rim of the wall curves sharply inward forming a U-shaped indentation. It is this remarkable configuration that constitutes the name Grand Canyon.

Because of the excellent visibility, divers can frequently see clear across the

chasm and the scenery is indeed spectacular. The tops of the two coral buttresses are at a depth of 70 feet and their sides form vertical walls which plunge straight down into limitless depths. Perhaps the greatest thrill is to swim from the point of one coral buttress to the other, thereby crossing the deep water of the canyon chasm. While making the swim, you are likely to feel like some sort of aquatic skydiver mysteriously suspended over 1200 feet of hypnotic blue ocean.

The walls of Grand Canyon are of course loaded with many gorgeous



# DIVE OPERATORS OF THE CAYMAN

DIVE OPERATOR	OWNER/MANAGER	CAYMAN TELEPHONE	COMPRESSOR	TANKS	DIVE BOAT/CAPACITY	DIVE GUIDES/INSTRUCTORS*	DEPARTURE TIMES	DIVES
<b>Casa Bertmar Diving Resort</b> Georgetown	Kent & Angela Eldemire	92514	Mako 17 cfm Mako 9.2 cfm Mako 9. cfm	150 aluminum	36 ft. Custom/25 divers 42 ft. Bruno & Stillman/ 35 divers	Kent Eldemire *Shane Eldemire Wes Van Der Bol Geoff Starden *Dickie Walls Dave Miller *Wayne Hasson, Jr.	9:00 am 1:00 pm 6:00 pm	2 tank boat dive 1 tank boat dive 1 tank night dive
<b>Quabbin Dives (Cayman) Ltd.</b> George Town	Athlee Evans	95597	Mako 17 cfm	100 aluminum	36 ft. Crusader/25 divers 34 ft. Crusader/15 divers	*Athlee Evans Joshua Powery	9:00 am 2:00 pm 7:30 pm	2 tank boat dive 1 tank boat dive 1 tank night dive
<b>F.L.A.G. Underwater Services, Ltd.</b> George Town	Gerry Willcocks Stuart Freeman	92606	Bauer 7.1 cfm Bauer 4.3 cfm Bauer 4.3 cfm	100 mixed	17 ft. Boston Whaler/ 6 divers	*Gerry Willcocks *Stuart Freeman	By appointment only	1 tank boat dive 2 tank boat dive
<b>Surfside Watersports</b> Galleon Beach Hotel	Will Mannon	92724 94478	Mako 9 cfm Mako 9 cfm	100 mixed	34 ft. Delta/20 divers 30 ft. Sea Truck/20 divers 26 ft. Sea Truck/15 divers	*Jim Holm *Jeff Kingstead Joffer Smith	9:00 am 2:00 pm 6:30 pm	2 tank boat dive 1 tank boat dive 1 tank night dive
<b>Cayman Diving Lodge</b> East End	Gerry Hytha	72483	Mako 15 cfm Mako 14 cfm Mako 8 cfm	110 mixed	33 ft. Custom/18 divers 32 ft. Seawind/15 divers 24 ft. Seacraft/8 divers	*Gerry Hytha *Rick Belmare *Ralph San Millan Jane John	8:30 am 2:00 pm 7:00 pm	2 tank boat dive 1 tank boat dive 1 tank night dive
<b>Underwater Castle</b> Tortuga Club	Frank Conolly	72488	Worthington 16 cfm Mako 9.2 cfm	60 steel	36 ft. Custom/20 divers 22 ft. Aquasport/6 divers 16 ft. Whaler/4 divers	*Darby Bodden Newman Conolly	9:30 am 2:00 pm 8:00 pm	2 tank boat dive or snorkeling 1 tank night dive
<b>Sunset House Diving Resort</b> George Town	Adrien and Bonnie Briggs	95966	Rix 20 cfm Worthington 20 cfm	300 aluminum	35 ft. Dive barge/20 divers 37 ft. Custom/25 divers 37 ft. Custom/25 divers	Adrien Briggs *Steve Lakes *Ron Lvanas Harris Scott *Carl Fisher Pat Davis	9:30 am 1:30 pm 7:30 pm	2 tank boat dive 1 tank boat dive or snorkeling 1 tank night dive
<b>F.L.A.G. Royal Palms Diving Service</b> Royal Palms Hotel	Glenn Galtire	92636 ext. 70 94557 (eves.)	Mako 15.5 cfm	100 aluminum	36 ft. Custom/25 divers 24 ft. Custom/12 divers	*Glenn Galtire *Jim Wyatt *Chester King	8:30 am 2:00 pm 7:00 pm	2 tank boat dive 1 tank boat dive 1 tank night dive
<b>Seasports</b> Seven Mile Beach	Capt. Butch Sjostrom	94430	none	40 aluminum	24 ft. Hydrodyne/7 divers 24 ft. Hydrodyne/7 divers	*Capt. Butch	By reservation	2 tank boat dive 1 tank boat dive 1 tank night dive
<b>Dive Cayman Ltd.</b> Coral Caymanian	Peter Milburn	72189 95341	Mako 17 cfm	60 steel	26 ft. Flattop/12 divers 26 ft. Flattop/12 divers	*Peter Milburn Don Foster	8:30 am 1:30 pm 7:00 pm	2 tank boat dive 1 tank boat dive 1 tank night dive
<b>Bob Soto's Diving Ltd.</b> Holiday Inn	Ron Kipp David Nicholson, Mgr. diving	94091 ext. 6	At Lobster Pot Headquarters	105 aluminum	52 ft. Custom drop front/ 35 divers 45 ft. Custom drop front/ 22 divers	*David Nicholson Mark Brownlee *Harry Fisher *Phil Parsons *Doug Perrine Georgia Dolack Ron Anglin Darvin Ebanks Ollen Miller	9:00 am 9:00 am 2:00 pm 7:00 pm	2 tank N. Wall dive 2 tank boat dive 1 tank boat dive 1 tank night dive
<b>Bob Soto's Diving Ltd.</b> Lobster Pot Headquarters	Ron Kipp Kem Jackson Mgr. engineering	92483	Ahrendts 15.5 cfm Ahrendts 15.5 cfm Mako 8 cfm	25 aluminum	55 ft. Luxury power cruiser/ 15 divers	*Ron Kipp *Bob Soto *Kem Jackson Nicole Pelletier John Glenn Miller Allen Bodden	9:00 am 9:00 am 2:00 pm 7:00 pm	All day N. Wall trip 2 tank boat dive 1 tank boat dive 1 tank night dive
<b>Bob Soto's Diving Ltd.</b> Beach Club Colony	Ron Kipp	92023 ext. 9	At Lobster Pot Headquarters	25 aluminum	At Holiday Inn and Lobster Pot locations	Guides and instructors at Holiday Inn and Lobster Pot HQ locations	9:00 am 9:00 am 2:00 pm 7:00 pm	All day N. Wall trip 2 tank boat dive 1 tank boat dive 1 tank night dive
<b>Bob Soto's Diving Ltd.</b> Cayman Islander	Ron Kipp	95533 ext. 1	At Lobster Pot Headquarters	40 aluminum	At Holiday Inn and Lobster Pot locations	Guides and instructors at Holiday Inn and Lobster Pot HQ locations	9:00 am 9:00 am 2:00 pm 7:00 p.m.	All day N. Wall 2 tank boat dive 1 tank boat dive 1 tank night dive
<b>M.V. Cayman Diver</b> Bob Soto's Pier	Jerry Jones	92007	Mako 9.2 cfm	18 aluminum	83 ft. Custom/12 divers	*Jerry Jones	Saturday	8 days/7 nights dive cruise around Grand Cayman and Little Cayman
<b>Cayman Kai Resort</b> North Side	Gene DeMarco	72573	Mako 9.2 cfm Bauer 9.2 cfm	75 mixed	28 ft. Flattop/16 divers 28 ft. Flattop/16 divers	*John Butler *John Darby	9:30 am 1:30 pm 7:30 pm	1 tank boat dive 1 tank boat dive 1 tank night dive
<b>Scuba Cayman Ltd.</b> Seven Mile Beach	Clinton Ebanks	93873	Mako 17 cfm	70 mixed	46 ft. Custom/25 divers	Clinton Ebanks Osmond Ebanks Ashton Ebanks	9:00 am 2:00 pm 7:00 pm	2 tank boat dive 1 tank boat dive 1 tank night dive
<b>Brac Aquatics Ltd.</b> Buccaneer's Inn Brac Reef Hotel	Winston McDermot	87257 Buc- caneer 87323 Brac Reef 87429 eves	Worthington 12 cfm Worthington 10 cfm Mako 7.2 cfm Mako 3.5 cfm	220 steel	43 ft. Trimaran/30 divers 41 ft. Custom/30 divers 32 ft. Custom/24 divers 27 ft. Custom/18 divers 24 ft. Outboard/6 divers	*Winston McDermot Terry Burke Cornell Burke Norbert Scott Peter Bradshaw	9:00 am 3:00 pm 9:00 pm	2 tank boat dive 1 tank boat dive 1 tank night dive



# ISLANDS

CAYMAN MAILING ADDRESS	U.S. INFO OFFICE	U.S. TELEPHONE
Casa Bertmar Diving Resort P.O. Box 637 Grand Cayman, BWI	Caymans Reservation Service 250 Catalonia Ave. Coral Gables, FL 33134	(305) 444-6551
Quabbin Dives (Cayman) Ltd. P.O. Box 7 Grand Cayman, BWI	Caymans Reservation Service 250 Catalonia Ave. Coral Gables, FL 33134	(305) 444-6551
F.L.A.G. Underwater Services, Ltd. P.O. Box 446 Grand Cayman, BWI	None	None
Surfside Watersports P.O. Box 891 Grand Cayman, BWI	Caymans Reservation Service 250 Catalonia Ave. Coral Gables, FL 33134	(305) 444-6551
Cayman Diving Lodge 241 E. Commercial Blvd. Ft. Lauderdale, FL 33334	Cayman Diving Lodge Reservations 241 E. Commercial Blvd. Ft. Lauderdale, FL 33334	(800) 327-8223 Nat'l (800) 432-8894 FL (305) 491-0333
Tortuga Cldb P.O. Box 496 Grand Cayman, BWI	Caymans Reservation Service 250 Catalonia Ave. Coral Gables, FL 33134	(305) 444-6551
Sunset House P.O. Box 479 Grand Cayman, BWI	Caymans Reservation Service 250 Catalonia Ave. Coral Gables, FL 33134	(305) 444-6551
F.L.A.G. Royal Palms Diving Service P.O. Box 490 Grand Cayman, BWI	Caymans Reservation Service 250 Catalonia Ave. Coral Gables, FL 33134	(305) 444-6551
Seasports P.O. Box 1516 Grand Cayman, BWI	Caymans Reservation Service 250 Catalonia Ave. Coral Gables, FL 33134	(305) 444-6551
Dive Cayman Ltd. P.O. Box 596 Grand Cayman, BWI	None	None
Bob Soto's Diving Ltd. P.O. Box 1801 Grand Cayman, BWI	Holiday Inn 7220 NW 36 St. Miami, FL 33166	(305) 592-8175
Bob Soto's Diving Ltd. P.O. Box 1801 Grand Cayman, BWI	Caymans Reservation Service 250 Catalonia Ave. Coral Gables, FL 33134	(305) 444-6551
Bob Soto's Diving Ltd. P.O. Box 1801 Grand Cayman, BWI	Caymans Reservation Service 250 Catalonia Ave. Coral Gables, FL 33134	(305) 444-6551
Bob Soto's Diving Ltd. P.O. Box 1801 Grand Cayman, BWI	Cayman Islander 18361 N. 2nd Ave. Miami, FL 33179	(305) 652-9716 FL (800) 327-6840 Nat'l Toll Free
M.V. Cayman Diver P.O. Box 1364 Grand Cayman, BWI	See and Sea Travel Service P.O. Box 350127 Ft. Lauderdale, FL 33335	(305) 983-0599
Cayman Kai Resort P.O. Box 1112 Grand Cayman, BWI	Hotel Plans, Inc. 1200 Harger Rd. Oak Brook, IL 60521	(800) 323-7600 (312) 655-5688
Scuba Cayman Ltd. P.O. Box 746 Grand Cayman, BWI	None	None
Brac Aquatics Ltd. West End Cayman Brac, Cayman Islands, BWI	Caribbean Adventures Ltd. P.O. Box 685 Land O Lakes, FL 33539	(800) 237-3803 Nat'l (800) 282-9178 FL (813) 996-4944

forms of marine life. There are some splendid trees of black coral and a very large basket sponge at the 100 foot level.

**Gale's Mountain** is another extraordinary coral formation perched on the edge of the drop-off. In fact, it is the only formation of its kind known to exist in Grand Cayman and is certainly worth seeing.

Gale's Mountain is a miniature submarine mountain peak which sits on the very edge of a coral drop-off. It is approximately 250 feet across the base, rises to within 40 feet of the surface and is flattened at the peak. This mammoth formation is flanked by two coral canyons which spill over the edge of the wall and help to give this peak an awe-inspiring appearance.

The coral mountain is covered with a diverse array of sponges, hard corals, soft gorgonians, and other forms of marine life. There are many pink vase sponges, and a few red cup sponges on this formation. This unusual mountain peak seems to attract an abnormal amount of fish activity. There are often great clouds of baitfish swarming around it and many schools of jack cruise continuously along this part of the drop-off.

**Josh's Canyon** is a lovely section of the North Wall approximately one mile west of the main channel. This is a very popular wall dive and very typical of the dozen or more drop-off sites to be found along much of the North Wall.

The outer face of the drop-off is deeply etched with coral canyons and a multitude of undercuts and small caves. Along the vertical face divers will find a marvelous array of black corals, sponges of every shape and color, and deep sea gorgonian fans.

**Grouper Point** is a remarkably beautiful drop-off located at the eastern end of the North Wall. The top begins at 65 feet. There is a forked coral ravine in the shape of a narrow V that has sculptured a tall thin promontory jutting out into the deep blue. The sides of this unusual formation are vertical and drop from 70 to 100 feet where they meet a white sand bottom. A small tunnel at the base of this formation cuts completely through the point of the promontory and runs from one coral ravine to the other.

Grouper Point is an exceptionally pretty wall with many black gorgonian fans, sponges and corals of all types. There are several Nassau groupers which hang in the crevices and under the ledges of this drop-off and a school of horse-eye jacks is often seen cruising the ravine. This spot is ideal for underwater photographers who prefer to spend a little more bottom time at a little less depth.

## CAYMAN BRAC

Cayman Brac is the second most popular vacation diving destination in the Caymans, and an island which offers a unique style of resort living. The Brac is a stringbean-shaped island some 90 miles

east of Grand Cayman. It is 12 miles long, one and one-half miles wide and supports a resident population of approximately 1500 people. There are only two resort hotels on Cayman Brac and both are popular among visiting divers. In addition to the two hotels, there are a couple of local bars, a half-dozen local restaurants and a jewelry shop which produces beautifully carved black coral.

Cayman Brac is quite easy to reach as there are several inter-island flights daily to Grand Cayman. In addition, there are direct flights coming in from Tampa, Florida.

Because of its shape, Cayman Brac has only two coastlines — the north shore and the south shore. Both offer excellent wall diving opportunities — the entire island is virtually ringed by coral walls.

## SOUTH SHORE

The Brac Reef Hotel is located on the south shore of Cayman Brac, close to the boat harbor at the western end. It is the newest and most modern of Brac's two hotels, and an absolutely splendid place for a family vacation. This lovely resort includes modern air-conditioned rooms, a swimming pool, a tennis court, a section of beach frontage and an observation pier. Approximately 200 yards from shore lies a coral barrier reef which parallels the shoreline for several miles. Beyond this barrier reef lies a drop-off with many lovely wall diving sites.

**The Hobbit** is an enchanting drop-off located just outside the boat harbor, less than one-quarter mile to the east. The top of this wall begins at 70 feet and features a number of bizarre looking sponges. For example, there are several giant barrel sponges measuring four feet in diameter and standing six feet tall. These big barrels are mostly situated on the top of wall in depths ranging from 70 to 80 feet.

Nearby is a giant double basket sponge which sits on the edge of the drop-off at 70 feet. Its massive form dominates the coral seascape and immediately attracts the diver's eye. This remarkable sponge formation is at least six feet tall and perhaps eight and one-half feet wide.

The drop-off itself is a series of massive coral hummocks and sharp ravines which often turn into tunnels. Within these passages are delicate formations of pink Japanese coral and small black coral trees. There are also many iridescent, azure vase sponges, brown tube sponges and red finger sponges.

**Anchor Canyon** is an exciting drop-off which begins at 65 feet and drops vertically to at least 1000 feet. The face of this wall is unusually craggy and deeply etched with many canyons, crevices and small tunnels.

The major attraction of this drop-off is a narrow coral canyon which houses a giant, 100 year old anchor. The crevice begins at 70 feet, forming a winding passageway which leads toward the face of





No Name Wall, North Sound, Grand Cayman.



the drop-off. At precisely 95 feet, one will find the iron anchor wedged tightly into the narrow crevice. The shank of the anchor is approximately nine feet tall and the flukes measure seven feet from tip-to-tip. Partially covered by encrusting corals and sponges, the anchor is solidly cemented to the sidewalls of the canyon. It is actually hanging four feet above the floor of the canyon and divers can swim under the flukes. It would appear that the anchor was accidentally dropped into this narrow crevice and became so tightly wedged that it had to be abandoned.

After carefully examining the anchor, divers are further thrilled by the exhilarating feeling of emerging from the narrow canyon onto the face of the drop-off at a depth of 100 feet. The bottom seems to fall away so suddenly that it takes your breath away. Anchor Canyon appears to be a natural gathering place for unusually large fish. Snappers weighing 40 to 50 pounds are frequently seen at this location, and groupers up to 60 pounds are considered common. On more than one occasion dive guides have encountered large jewfish (200 pounds) resting inside the canyon alongside the anchor. On one dive, we encountered two, large six foot wahoo just as we began our descent.

**South Wall** is still another lovely drop-off a few hundred yards east of Anchor Canyon. Once again, the top of the wall begins at 70 feet and drops vertically almost immediately. The face of this wall is covered with large brown tube sponges, huge gorgonian seafans and many black coral trees. Perhaps the most interesting sponges for underwater photography are the small, crimson red cup sponges and the bowl shaped, flaming orange vase sponges. This area is also loaded with numerous azure blue sponges.

#### NORTH SHORE

The North Shore of Cayman Brac offers an entirely different topography. The shoreline itself is made up mostly of iron-shore and hard coral ledges. However, there is no barrier reef along this coastline, and fringing coral reefs come very close to land. It is along the north shore that most of Cayman Brac's beach diving is found.

Also on Cayman Brac's north shore is the Buccaneer Inn, the island's best known dive hotel. This beachfront resort offers a comfortable and casual atmosphere which is ideally suited for dive clubs and dive groups. The hotel complex consists of a beach bar restaurant, small swimming pool and several long buildings which contain the room accommodations. Almost directly off the Buccaneer Inn are some of the finest drop-offs to be found on Cayman Brac.

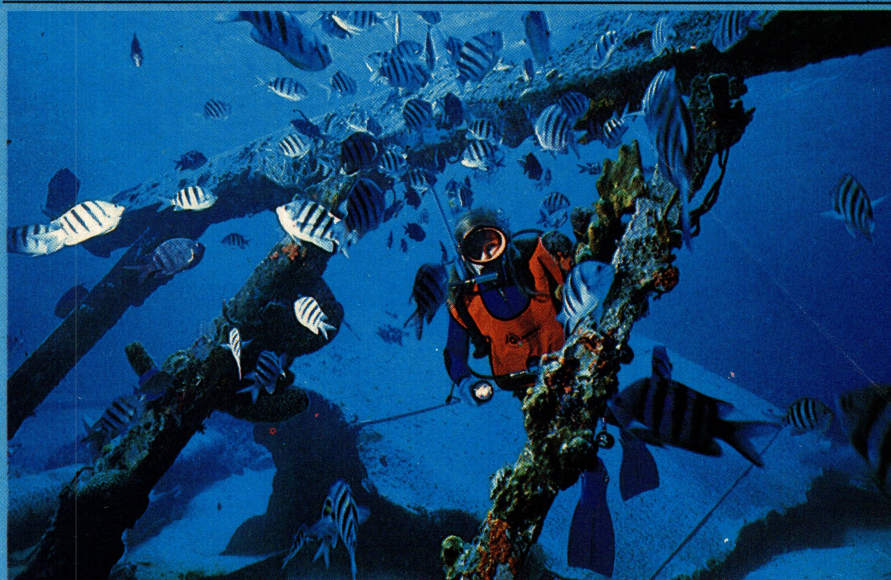
**Buccaneer Chute** is a drop-off located slightly west of the resort hotel. The top of this wall begins at 50 feet and consists of many high coral heads and deep

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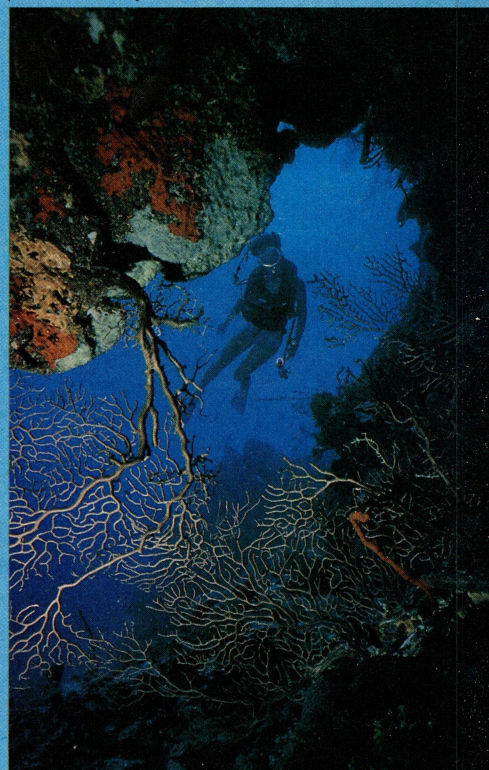
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ravines. The face of the wall is vertical and features a multi-faceted configuration.

Some of the narrow coral ravines which empty out into the drop-off are now overgrown with coral and thus form small tunnels. One of these passageways is over 120 feet long, beginning at 55 feet and sloping gradually to the edge of the drop-off where it exits into open water at 150 feet. It is one of the longest and most exciting coral tunnels on the north side.

photo/Jim & Cathy Church



Josh's Canyon, North Sound, Grand Cayman.

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The face of the drop-off and vertical sides of its many ravines are covered with tightly packed hard corals, branching gorgonian fans, swaying seaweeds and a marvelous array of colorful sponges. Diving this wall is like swimming through a botanical garden.

There is an impressive amount of fish action along this drop-off. Large eagle rays are often seen cruising along the upper edge of the wall. There are also schools of blue runners, horse-eye jacks and crevalle jacks which make brief but fleeting appearances. Goggle-eyed groupers silently observe the intruding diver's actions with their poker faces constantly pointed toward the flailing humans.

**Ship's Graveyard** is an outstanding wall dive located just east of the Buccaneer Inn. Its precise location is marked by an old pirate graveyard where treasure coins have appeared from time to time. It is considered to be one of the best wall dives on the Brac.



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The drop-off begins at a depth of 45 feet and quickly slopes to 80 feet where it becomes absolutely vertical. The top of the wall is filled with a dazzling mixture of giant seafans, slender sea-whips, hard corals in every shape imaginable and sponges of all kinds. For example, there is a cluster of yellow tube sponges which must contain more than 35 individual tubes — all bright yellow in color. The face of the wall is loaded with azure vase sponges, large basket sponges, and brown tube sponges. Visibility in this area averages 150 feet or better.

Ship's Graveyard is a very busy drop-off for fish action. Eagle rays and schooling jacks are constantly cruising along the edge. There are also several active cleaning stations along the top edge of the wall, with groupers lined up and waiting for their turns.

### LITTLE CAYMAN

Little Cayman is another small string-bean-shaped island just a couple of miles west of Cayman Brac. It is barely nine miles long, two and one-half miles wide and virtually uninhabited. The total resident population of this natural tropical paradise is barely 20 people. There is no hotel, no marina and just a few small grass landing strips for small cargo planes.

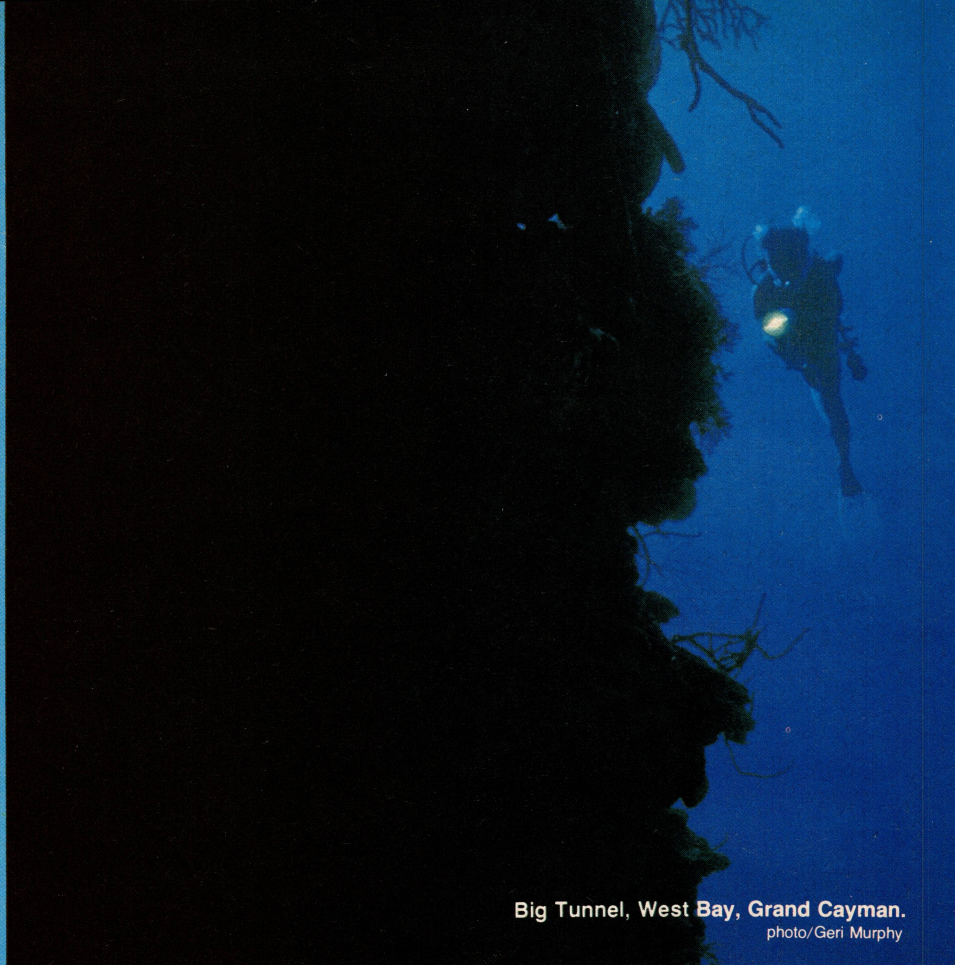
Divers visiting Little Cayman must come by boat, as there is no other con-

venient form of transportation. The dive operator on Cayman Brac runs an all day dive trip to Little Cayman at least once or twice a week when the weather is good. The *Cayman Diver* also makes an occasional excursion from Grand Cayman, with weather permitting.

In spite of its remote location and difficult access, Little Cayman is immensely popular with visiting divers. It is considered to be the site of some of the finest wall diving in all of the Caymans — and very possibly all of the Caribbean. The drop-offs along the North Shore of Little Cayman are indeed extraordinary and worth the effort to get there.

**Jackson Point** is located two-thirds of the way west along the north coast of Little Cayman. It is an incredibly diverse drop-off similar to the north wall of Grand Cayman. The drop-off begins at 50 feet and tumbles downward in a fascinating conglomeration of high coral heads, narrow canyons, and sheer walls. This jumbled terrain provides endless hours of fascinating exploration and it is doubtful that anyone can fully appreciate it in merely one dive.

Jackson Point abounds with marine life of every type. There are huge, iridescent tube sponges of icy blue texture, large, heart-shaped pink sponges which look like sculptured vases, great basket and barrel sponges the size of living room furniture, and crimson-red sponges literally hanging from the branches of black



Big Tunnel, West Bay, Grand Cayman.  
photo/Geri Murphy



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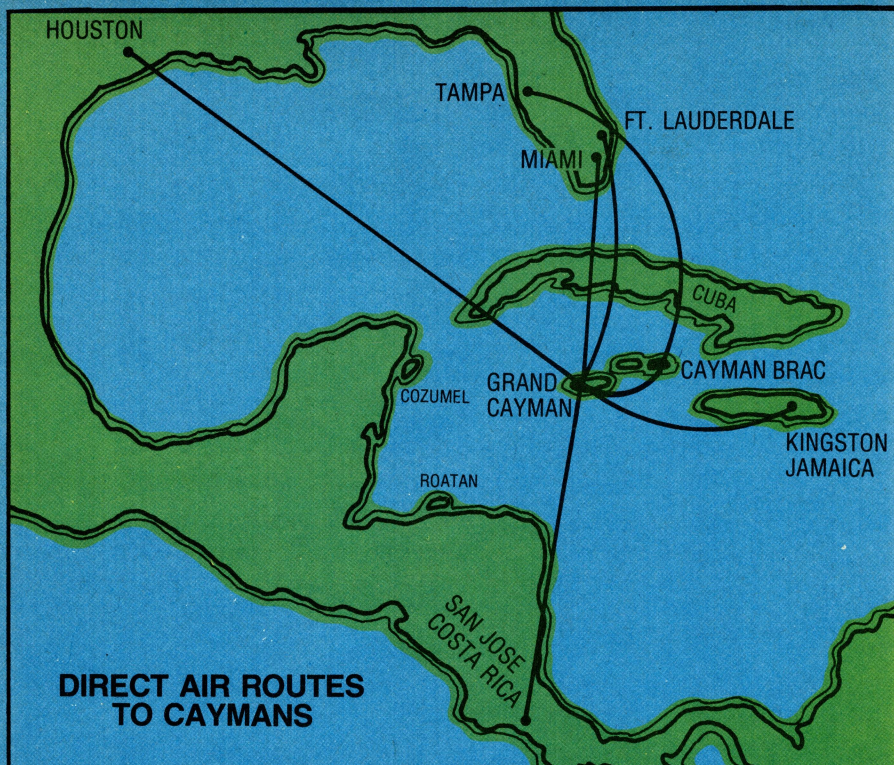
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coral trees. Much of the drop-off is vertical in nature from 70 feet down.

Jackson Point also harbors some of the largest angelfish to be seen anywhere in the Caribbean. There are stately queen angels, the size of fish platters and brilliantly colored French angels with golden scales the size of a thumbnail. On frequent occasions large schools of horse-eye jacks swoop down the face of the wall like a squadron of phantom fighters. This location is reputed to have some of the finest black coral trees still to be found in the Cayman Islands.

**Bloody Bay Wall** is considered to be the most breathtaking drop-off in all the Caribbean. In fact, it has often been described as one of the Seven Underwater Wonders of the World. This unusual drop-off begins at the remarkably shallow depth of 22 feet and drops vertically to 600 feet and beyond. The most prominent feature of the wall is the spectacular array of exotically colored sponges. A rare form of platinum yellow pipe sponges can be found here in great abundance, with brilliant specimens growing every 10 feet or so along the face of the wall. Azure cup sponges and pink vase sponges are equally plentiful. There are also many lovely formations of cream colored vase sponges, emerald green tube sponges, red finger sponges and black coral trees. The face of the wall is a veritable Garden of Eden with marine life so unique it is not duplicated anywhere else in the Caribbean.

The face of this drop-off is much different from other Cayman walls. It is a smooth, flat, vertical face, like the side of a giant concrete dam. This unwavering facade is unbroken by canyons or ravines. Occasionally, there is a narrow horizontal ledge or slight indentation but little more. Diving this wall is like hanging out in blue space like a hummingbird in flight.

**Three Fathom Wall** is a small section of Bloody Bay Wall which comes up to within 18 feet of the surface. It is one of the only vertical drop-offs in the Caribbean which can be easily dived on snorkel!

The face of the wall in this area is somewhat broken by several small canyons and crevices. There is one winding ravine at a depth of 60 feet which finally turns into a coral tunnel and leads to a high vaulted cavern beneath the reef. A small opening in the roof of the cavern allows sunlight to illuminate the interior. The face of this drop-off is also loaded with exotic sponges and large black coral trees.

The top of the wall is a beautiful coral sea garden which is filled with gently swaying seafans, feathery seaplumes, swaying seawhips, brain corals, and sponges of every type. Depths along the top of the reef range from 15 to 20 feet and the area is loaded with all types of invertebrates. Many photographers spend the remaining portion of their wall dives



browsing through this lovely sea garden and shooting macro photography while they decompress.

Because of the limitations of space I have been able to describe only a small, representative sample of the remarkable wall diving to be found in the Caymans. It would literally take years to see all of the drop-offs which have been charted. The purpose of this report is to shed some light on the tremendous variety which exists among the Cayman Islands. No other islands in the Caribbean offer so much in such a small area.

While this report has been devoted solely to wall diving, it is only half of the picture. Cayman is by no means limited to drop-offs alone. There are a multitude of other scuba experiences which can be enjoyed by beginners and experts alike. While wall diving is the major attraction which brings serious scuba



Photo / Geri Murphy

**Cemetery Wall, Cayman Brac.**

buffs to the Caymans there are indeed other forms of diving which are equally superb.

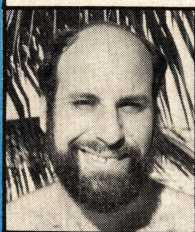
Shallow coral gardens for snorkelers and beginning scuba divers can be found along most any part of the shoreline in Grand Cayman, Cayman Brac or even Little Cayman. These twinkling coral reefs lie in depths from 4 to 20 feet and provide an alluring wonderland for the beginning sightseer. It is almost like entering a make-believe aquarium filled with fish and pretty coral.

While most all of the drop-off diving is done by boat, beach diving is surprisingly popular among Cayman Islands visitors. While beach diving sites are available on a more limited basis, the quality of these close-by reefs ranks very high. There are excellent coral reefs directly in front of: the Sunset House, Casa Bertmar Resort, Spanish Bay Villas, Cayman Diving Lodge, and the Buccaneer Inn. Other popular beach diving locations include; selected sites along the north shore of Cayman Brac, the north side of George Town Harbor, on Grand Cayman, and the South Sound area as well.

Still another exciting facet of Cayman Islands diving are the numerous shipwrecks which offer endless hours of undersea exploration. The scattered remains of the *Balboa* lie just off George

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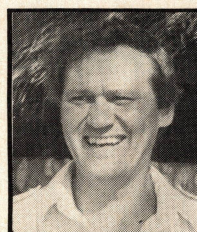
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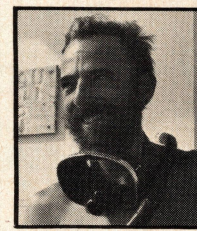
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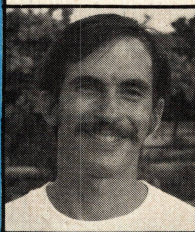
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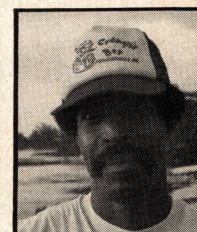
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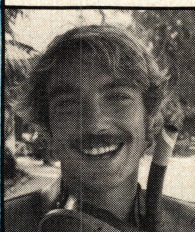
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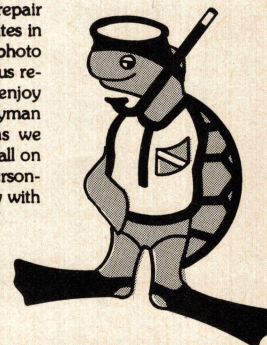


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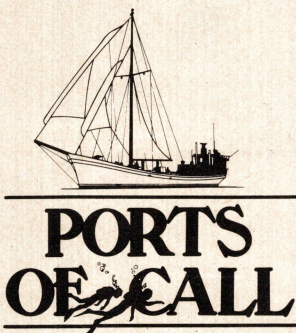
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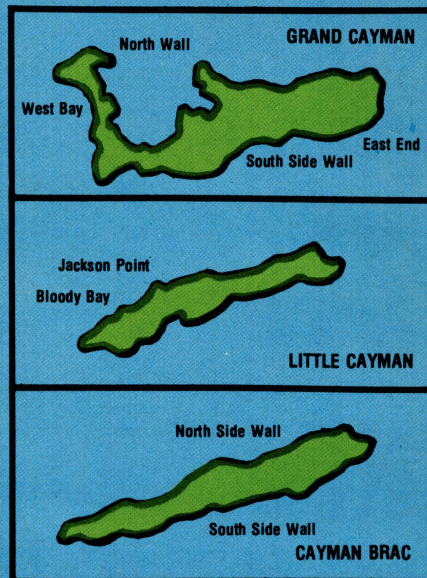
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Town Harbor and provide a fascinating underwater junkyard filled with schools of fish, moray eels, octopus and other unusual creatures. The *Oro Verde* is a new ship sunk off Seven Mile Beach. This steel hulled freighter remains totally intact and lies in 50 feet of water where it can be explored and photographed with ease. There are two more shipwrecks located at the east end of Grand Cayman in 18 to 30 feet of water. The wreck of the *Soto Freighter* lies up against a coral reef off the south side of Little Cayman with diving depths down to 50 feet. The historic remains of the *Prince Frederick* lie among an elkhorn coral forest off the south side of Cayman Brac. Each of the three Cayman Islands has its share of shipwreck mystique, and each island offers a distinctly different type of wreck diving experience.

As for medium depth reefs, the Cayman Islands offer hundreds of coral reefs ranging in depth from 30 to 60 feet. These sites are frequently used as a second dive location after making a deep wall dive. Many of these reefs are loaded with fish that have been tamed and can be fed by hand. There is no shortage of coral reefs at almost any desired depth.

Perhaps some of the most fascinating attractions of Cayman's undersea world (other than wall diving) are the remarkable coral tunnel and cave formations which abound in these waters. Many of



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the shallow coral reefs are virtually honeycombed by a complex labyrinth of coral passageways, vaulted caverns, low ceiling grottoes and giant caverns. These winding and twisting passageways are usually well-lit by natural sunlight which filters down through the many cracks and holes in the top of the coral reef. These tunnels and caves are extremely safe for exploration and provide endless hours of entertainment. Some of the more famous tunnel mazes include: Soto's Reef, Devil's Grotto, Kent's Caves, Eden Rock, and Ironshore Gardens. Dive





photo / Geri Murphy

**Coral polyps at night, Little Cayman.**

depths range from 15 to 35 feet and many of these networks cover acres.

#### HOW TO GET THERE

The Caymans are a cluster of small islands almost precisely in the center of the Caribbean Sea. They lie just south of Cuba and directly west of Jamaica, along the same latitude as Cozumel. The Caymans are easy to reach by convenient non-stop jet service from several gateway cities in the U.S. Air service to these islands is conducted on a regular basis by at least five different airlines, many of which operate daily flights.

For example, Cayman Airways operates daily non-stop BAC-111 jet service to Grand Cayman from both Houston and Miami. Republic Airlines operates DC-9 non-stop jet service from Miami to Grand Cayman daily. Red Carpet Airlines provides DC-3 flights from Tampa non-stop to Cayman Brac and on to Grand Cayman. LACSA operates jet service from Miami to Grand Cayman and then on to Costa Rica. Western Airlines offers excellent connecting flights to Miami from most major U.S. cities. Air Jamaica operates jet service from Kingston, Jamaica to Grand Cayman. In addition, there are regular inter-island connecting flights between Grand Cayman and Cayman Brac via Red Carpet Airlines or Cayman Airways.

Since the Cayman Islands are a British Colony, English is the universally spoken language and U.S. dollars are gratefully accepted just about everywhere. Entry requirements for the Cayman Islands are a passport, birth certificate or voter's registration card for U.S. citizens. For more information about dive services refer to the Dive Operators Chart on pages 92 and 93. For more information about hotel accommodations, general tourism services or airline schedules, contact the Cayman Islands Dept. of Tourism, 250 Catalonia Ave., Suite 604, Coral Gables, FL 33134. If you want flight information in a hurry you can call Cayman Airways' toll free number (800) 327-2864.

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# Scuba Quiz

## Category: Underwater Photography

By Dennis Graver

Surely one of the most important aspects of photography is getting the correct exposure. There are many variables that affect this and a knowledge of these can greatly increase the number of usable photos you obtain. Test your knowledge of photographic exposure with the following questions. The answers are on the next page.

1. The basic exposure for above water photography on a clear, bright day when the camera is aimed at an average subject is a shutter speed that is a reciprocal of the film speed and an f stop of:

- ☐ A. 16
- ☐ B. 8
- ☐ C. 4
- ☐ D. 2.8

2. The equal exposure value of f16 at 1/60 second is:

- ☐ A. f5.6 at 1/500
- ☐ B. f11 at 1/30
- ☐ C. f22 at 1/125
- ☐ D. f8 at 1/125

3. The increase in exposure with increasing depth in clear, calm water at noon on a clear, bright day is approximately one f stop for each:

- ☐ A. 1 foot of depth
- ☐ B. 3 feet of depth
- ☐ C. 15 feet of depth
- ☐ D. 25 feet of depth

4. Select the exposure setting yielding the greatest depth of field:

- ☐ A. f4
- ☐ B. f5.6
- ☐ C. f8
- ☐ D. f11

5. A light meter is set for ASA 400 and reads f11. The proper exposure for film with an ASA rating of 50 would be:

- ☐ A. f8
- ☐ B. f5.6
- ☐ C. f4
- ☐ D. f3.5

6. When a 2X (0.30) neutral density filter is used, the exposure increase in stops is:

- ☐ A. 1/2 stop
- ☐ B. 1 stop
- ☐ C. 2 stops
- ☐ D. 3 stops

7. Select the correct exposure for a filter with a filter factor of 4:

- ☐ A. Open the lens by four stops
- ☐ B. Stop down the lens by four stops
- ☐ C. Divide the film ASA by the filter factor
- ☐ D. No exposure correction is necessary

8. If using a strobe underwater that has an above water guide number of 120, approximately what aperture should you use at a depth of 30 feet in clear water and a subject distance of three feet?

- ☐ A. f2.8
- ☐ B. f8
- ☐ C. f11
- ☐ D. f22

9. With an underwater guide number of 20 and a light meter reading of f4, the subject distance needed to balance ambient light and artificial light is:

- ☐ A. 2 feet
- ☐ B. 4 feet
- ☐ C. 5 feet
- ☐ D. 10 feet

10. If optimum exposure for macro photography with a 3:1 extension tube is obtained when a strobe is 12 inches from a subject, how close should the same strobe be held to photograph the same subject under the same conditions with a 1:1 extension tube?

- ☐ A. 12 inches
- ☐ B. 6 inches
- ☐ C. 4 inches
- ☐ D. 2 inches



# Scuba Quiz

## Answers: Underwater Photography

**1. A. 16.** Basic daylight exposure is equal to a shutter speed that is the reciprocal of the ASA of the film when the aperture is set at f16. For example, with a film speed of 125, the exposure settings should be 1/125 at f16. This rule, also called the "f16 rule," can be used if no light meter is available or to roughly check the accuracy of a meter.

**2. A. f5.6 at 1/500** Each time an f stop number is decreased, the amount of light reaching the film is doubled; but for each successively faster shutter speed, the length of time the film is exposed to light is halved. These equal exposure settings are useful to allow adjustment for either aperture or shutter exposure priority.

**3. C. 15 feet of depth.** Nothing can replace a light meter, but when no meter is available, this crude rule of thumb may save the day. With EK64 film, the settings are 1/60 at f16 at the surface, 1/60 at f11 at 15 feet, 1/60 at f8 at 30 feet, and 1/60 at f5.6 at 45 feet. Be sure to bracket exposures!

**4. D. f11.** Depth of field is the distance between the points nearest to and farthest from the lens at which the images are in focus. The smaller the lens aperture, the greater the depth of field. Lens aperture can be used to emphasize a subject by causing the foreground and background to be out of focus.

**5. C. f4.** Each time an ASA number is halved, either the f stop can be decreased by one stop or the shutter speed can be halved. If the 400 ASA is reduced to 200, an additional f stop is required. If reduced to 100, two stops are required, and if reduced to 50, the lens would need to be opened by three stops.

**6. B. 1 stop.** Filters absorb light. Density is a standard measurement of the amount of light absorbed. A density of 0.30 equals one f stop of exposure. Neutral density filters are useful when high speed film, used for low light levels, must be used for brightly lighted scenes.

**7. C. Divide the film ASA by the filter factor.** A filter factor is a designation of the density of a filter and is the number of times an exposure must be proportionally increased to compensate for reduced light. The exposure may be increased by opening the aperture, reducing the shutter speed, or rerating the ASA number. The ASA rerating was the only correct answer to the question.

**8. D. f11.** Water attenuates light and requires a "bugger factor" to be applied to guide numbers. The factor is four for subjects beyond two feet. Therefore, the underwater guide number for this question is  $120 \div 4 = 30$ . Correct exposure is obtained by dividing the corrected guide number by the flash-to-subject distance ( $30 \div 3 = 10$ ). The nearest aperture setting is f11.

**9. C. 5 feet.** Since the aperture setting can be obtained as in the previous question ( $\frac{\text{guide no.}}{\text{distance}} = \text{f stop}$ ), distance can be obtained by rearranging the equation ( $\frac{\text{guide no.}}{\text{f stop}} = \text{distance}$ ). Therefore,  $20 \div f4 = 5$  feet, which will result in a balance between artificial and natural light.

**10. C. 4 inches.** Extension tubes reduce the speed of a lens by increasing the focal length. Light intensity increases as the strobe-to-subject distance is decreased. At six inches there is four times as much light as at 12 inches, and at four inches there is nine times as much light, which offsets the decreased lens speed.

*It has been said that, "Experience is a good teacher, but it usually gives the test before the lesson." Underwater photography can be very frustrating to learn by experience. To achieve good results quickly, complete an underwater photo course. You'll learn a great deal about exposure settings and a lot of other valuable information as well. By the way, if you answered all of the questions in this quiz correctly, you're an expert photographer and should have some great shots.*



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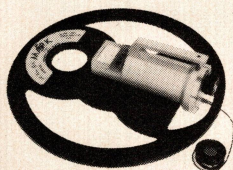
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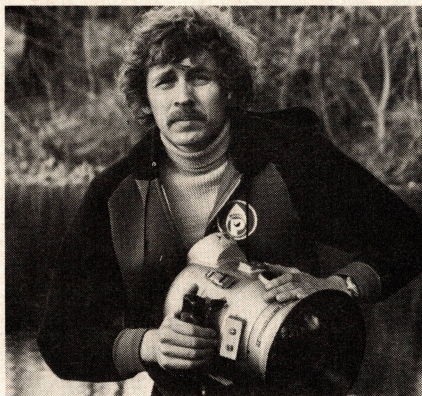
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Award winning underwater film maker Ron Coley has been awarded a research and development grant to begin the preliminary work for a one hour special for national public television. The TV special will deal with the underwater archaeological excavation of a 1700 year old Indian village located in central Texas.



According to Coley, a past recipient of an Our World—Underwater scholarship, "The film will deal with man's ancient and enduring fascination with the San Marcos River; a remarkable body of crystal clear water that is the only known habitat for a wide variety of unique aquatic plants and animals."

For more information contact: Bonnie K. Gangelhoff, KUHT-TV, Channel 8, 4513 Cullen Boulevard, Houston, TX 77004, (713) 749-2304.

## SEA ROVERS

The Boston Sea Rovers' 27th annual Underwater Clinic will be held on March 14. Stanton Waterman, well known underwater film producer and film lecturer, will be featured on the evening program presenting two new and exciting films, to be held at the John Hancock Hall. A Sea Rovers reception to meet the speakers will follow immediately after.

There will be a daytime program featuring 27 speakers on underwater educational and informational subjects. Included this year for the first time will be a special session sponsored by the Undersea Medical Society on sport diving medicine and accident treatment. Another new addition will be a session on New England underwater archaeology. The daytime program will be held at Boston University, Commonwealth Ave., from 10 am to 4 pm.

For more information call or write Glen Reem, 30a Rockville Ave., Lexington, MA 02173, (617) 861-7651. For tickets write: Ray Oteri, Box 176, Hull, MA 02045 (617) 925-1991.

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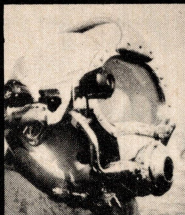
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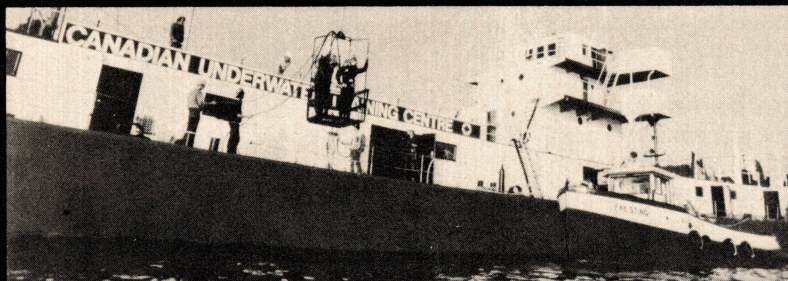
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The event will begin at noon on Saturday at the new Mission Valley Motel and Conference Center with a series of concurrent workshops on a variety of subjects which will include: underwater photography, dive medicine, wreck diving, fish identification, home aquarium construction, seafood cooking and research diving.

The program will also include presentations on the Southeastern Undersea Research Facility (SURF) being established at Wilmington, North Carolina and a presentation on the record saturation dive made to a simulated depth of over 2000 feet in the hyperbaric chamber at the Duke University Medical Center.

Saturday evening will feature an underwater film festival with Paul Tzimoulis, Editor/Publisher of SKIN DIVER Magazine, as master of ceremonies. Tzimoulis will also conduct special workshops on Saturday and Sunday on macro photography.

Rounding out the two day program, will be a photo contest, dive travelogues and tourism presentations, and continual displays and demonstrations of diving equipment in the large covered swimming pool area.

For more information, write to the Office of Marine Affairs, 417 N. Blount Street, Raleigh, NC 27611 or call (919) 733-2290.

## DIVER MEDIC TRAINING

Agreements have been completed between the Commercial Diving Center and the Daniel Freeman Hospital under which the hospital will present medical training for students in the Los Angeles Harbor based deep sea diving school.

Commenting on the medical training for the school's students, executive director, Jim Joiner, pointed out that the dive industry has a constant demand for graduates with medical specialty training. Said Joiner, "In 1975 CDC was tasked by its parent corporation, Ocean-eering International, Inc., to design a medical course, and institute the concept of EMT/D classes at the request of the dive industry which was seeking to provide additional safety protection.

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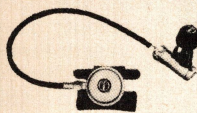
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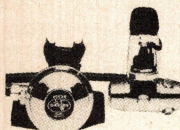
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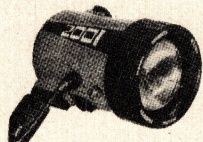
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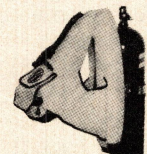
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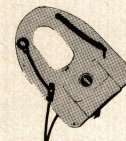
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**NEMROD AIR B.C.**  
Super buoyancy compensator complete with push-button air tank. Dlx. features. List \$240.  
**\$140.** NEMROD AIR B.C.



**U.S. DIVERS BC700**  
New, 1981 cordura B.C. Lever dump. CO<sub>2</sub>. Low pressure inflator. Whistle, etc. List \$187.  
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Lycra/nylon in waist high or farmer style. Stripes, over stitching, pads, etc. List to \$310.  
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Sharkskin type, nylon lined, stitched seams. Waist high, 5 zipper 1/4" or 3/16". List to \$138.  
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**TUNIC**  
Short sleeve zip jacket, with crotch flap. Taped seams, colorful, mens or ladies. List \$65.  
**\$45.** TUNIC

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**FREE CATALOG**  
If you think these prices are great, wait till you see our discount catalog with hundreds of specials.  
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Phone: (516) 826-8888

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Phone ( ) \_\_\_\_\_

**Please rush attached order!** Sorry NO C.O.D.

\$ \_\_\_\_\_ enclosed (N.Y. add tax)  
or bill my charge card (Minimum order \$75.00)  
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Signature \_\_\_\_\_

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Minutes from Manhattan and Kennedy Airport.

Underwater life support systems are potentially dangerous to a non-trained user. Phone or mail order purchases of Scuba Tanks, Regulators or Buoyancy Compensators must include instructor's name and number or a copy of your certification. This ad does not constitute an offer to sell these items via mail order.





## NEW! WATERSPORTS ALARM CHRONOGRAPH

IMMEDIATE DELIVERY — MONEY BACK GUARANTEE

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breakthrough from ...

# CASIO

Never before  
such a watch  
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this low price

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FINALLY  
AN AFFORDABLE  
UNDERWATER WATCH

We have not seen an underwater watch that even approaches the value of this superb new CASIO. This is the same rugged, good-looking underwater alarm chronograph just now being advertised in national magazines by the few mail order advertisers lucky enough to get them. At **ON THE RUN** this wonder is available to you for only **\$39.95**.

### COMPARE THESE FEATURES:

- Water resistant to over 300 feet
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- 12/24 hour European/military time
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Call TOLL FREE number below or send check for \$39.95 plus \$2.50 for first watch, \$1.00 for each additional watch. Minnesota residents add 4% tax. 30-day unconditional return if not completely satisfied. Watch is generally shipped immediately upon receipt of order. (Try to get this from other mail order suppliers.) For an additional \$2.00 we will ship U.P.S. Blue Label for 48-hour delivery. One year manufacturer's warranty with convenient service-by-mail facilities in the United States.

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ORDER TOLL FREE

24 hours a day — (800) 346-3354

Minnesota residents, or if no answer,  
Call (800) 835-2246

## SCUBA ACCIDENT HOTLINE

Help with treatment of scuba diving accidents anywhere in the United States is now available 24 hours a day by dialing 1 (919) 684-8111 and asking for DAN (Diving Accident Network).

The network is a project of the F. G. Hall Laboratory for Environmental Sciences of the Duke University Medical Center. The F. G. Hall facility, directed by Dr. Peter Bennett, is administering DAN under an initial two year \$270,000 grant from the National Oceanic and Atmospheric Administration (NOAA) and the National Institute for Occupational Safety and Health.

Anyone needing emergency help in a scuba related accident calls (collect if need be) and specifically asks for the Diving Accident Network. The caller is then connected to one of the trained, experienced Duke physicians, on call at the center 24 hours a day under the direction of Dr. J. Miller, Associate Professor of Anesthesiology.

The Duke physician determines if the Region nearest the victim has the equipment and staff to handle the case. If not, the center staff connects the diver to the next nearest region. Regional coordinators can then assist with arrangements for jet or other transportation for the victim and for necessary treatment.

"After treatment has been given," Bennett said, "the regional coordinator's office sends us a complete record of the case. We feed this into our computer files and the data is available for much needed epidemiological analysis. In this way we will serve as a major source for information on the location, frequency, diagnosis and treatment of diving accidents in this country." >

## AID DIVE

The Kitchener-Waterloo and District Underwater Association will hold its 7th annual AID Dive (An Ice Dive) for charity in Elora quarry. The date for this year's ten hour relay is Saturday, February 21.

The purpose of this dive is to raise money for a particular charity or organization in the Kitchener-Waterloo area. In previous years \$1,200 was raised for the Sunbeam Home, \$1,500 for the Big Sisters Movement, \$3,500 for the Physically Disabled, \$3,700 for the Kitchener-Waterloo chapter of the Kidney Foundation, \$5,000 for the Rotary Club of Kitchener, and last year \$9,000 plus for the Developmental Centre in Waterloo.

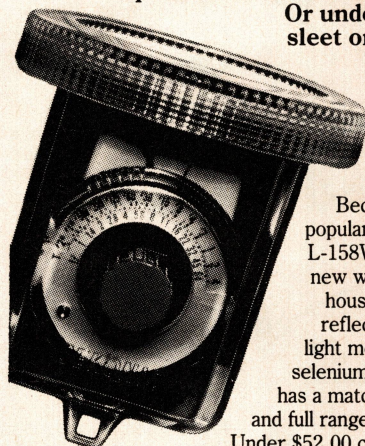
The goal this year is \$9,000 plus, which will be used to sponsor a day camp for the local chapter of the Ontario Society for Autistic Children.

For information, call 579-6771. >

# Sekonic all-weather light meters.

Now, you can precisely measure light for taking perfect pictures in all the wettest places.

To a depth of 200 feet underwater.  
Or under rain, sleet or snow.



Because the popular Sekonic L-158WH has a new watertight housing. This reflected type light meter with selenium cell also has a match needle and full range of ASA. Under \$52.00 complete.

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CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

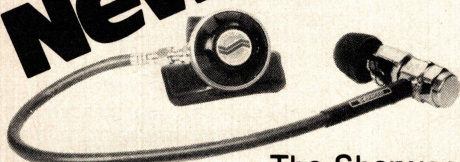




# IT'S NOT A STORY, WE WON'T FIB!

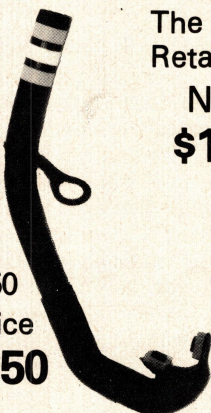
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United States (\$2.50  
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Underwater life support systems are potentially dangerous to a non-trained user. These include scuba tanks, regulators and buoyancy compensators. This ad does not constitute an offer to sell these items via mail order.





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Call direct to Berry Scuba "Hot Line"  
We will credit your call to your order  
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Stabilizer Jacket w/Pac & Inflator	\$129.50
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Underwater life support systems are potentially dangerous to a non-trained user. These include regulators, tanks, and buoyancy compensators. This ad does not constitute an offer to sell these items via mail order.

## TIDDLY-WINKS

(Continued from Page 39)

at the window in the side of the tank to give the odd word of encouragement: "Persevere . . . persevere," he would say. After a while, we managed to keep the torch going long enough to cut through one inch steel plate.

One afternoon, when the last diver was in the tank, we opened the drain valve to speed things up a little. The diver, crouched low over his work, was unaware of the falling water level. On finishing his cut, he stood up, and to his astonishment, found himself in air. It was with the foulest of language that he dragged himself up the steep ladder out of the tank.

The welding portion of the course consisted, for the most part, of running row upon row of beads across a steel plate. This was done in various positions, with the invariable result that vertical and overhead welds resembled a trail of bird-droppings. Porosity, according to the Chief, could best be detected by urinating on the weld: A quality-control method unknown to Lloyds and the ASME.

With the completion of the welding, the course came to an end. On the final day the Chief handed out the diplomas: impressive pieces of paper stating that we had, "undergone a course of instruction in the use, care and maintenance of standard dive equipment and underwater cutting and welding equipment," and were, "qualified to undertake work." One wag asked the Chief how important these certificates were: "You can't get a job without one!" was the emphatic reply.

Thus reassured, I went out into the jungle of the outside world. Soon I was knocking at the door of a dive company. Asking for a job would be a mere formality, of course: Once they saw my certificate I would be off to the North Sea and El Dorado.

Ushered into the office of the operations manager, I proudly produced my diploma. There was a long silence. At length he smiled. "Now isn't that nice," he said. "And do you play tiddly-winks, too?"

Undaunted, I called on a second company; then a third; then a fourth: at each the result was the same.

Finally, my spirits flagging, I crossed the channel to France. There, at last, I found a company willing to hire me. They didn't even hold my diploma against me; after all, I had had plenty of experience with scuba — a French invention — and as for all that hardhat gear; well, it belonged in a museum.

## 47th STREET UNDERWATER PHOTO COMBINATIONS



**MINOLTA POCKET CAMERA  
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World's first floating camera.  
**\$89<sup>50</sup>**

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NIKONOS IV w/35mm lens. . . . . CALL  
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Outfits w/camera lens & winder combo  
Canon AE-1 w/50mm f1.8. . . . . 529.00  
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Nikon FE w/50mm Fi.8. . . . . 479.50  
Olympus OM-1N w/50mm fi.8. . . . . 429.50  
Olympus OM 10 w/50mm f1.8. . . . . 399.95

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string brief from France  
Riviera string slip from Nice; briefest square basket  
front, demi dos, stretch string sides with detach-  
able silver clips. Choose soda yellow; sultan red. \$22  
rushed air mail; or send \$1 bill to open credit  
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## CLIFTON PROMOTED

Julie M. Clifton was recently promoted to store manager for Buddy Line Divers, a PADI five star training facility. Julie is an avid diver, experienced in diving the low-visibility, high-current conditions associated with the Charleston area. She holds the PADI advanced open water certification and several PADI specialty course ratings.

In addition to overseeing all purchasing and retail sales operations, Julie is also factory trained in the repair of all major brands of scuba equipment. Julie has been assistant sales manager for the past two years. 🐠

## W. VIRGINIA U/W COUNCIL

Various dive instructors and dive club representatives within West Virginia recently met and formed the WV Underwater Council. The purpose of the Council is to promote all aspects of skin and scuba diving in West Virginia. This includes: safety, organization, legal assistance, and legislative lobbying to pass laws favorable to divers. Divers, instructors or clubs interested in joining the council should write: Jim Carez, Rt. 9, Box 215, Parkersburg, WV 26101. 🐠

## WRITING DIVERS

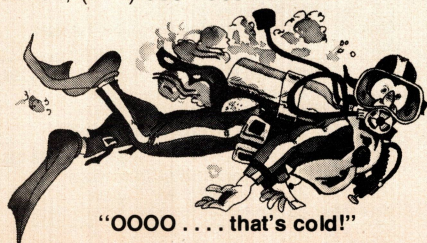
Anchor Press, a division of Rowe Publications, is seeking potential book manuscripts. Through 1981, diving writers may submit manuscripts for review. Of special interest are dive guide books for state, region or local areas of the U.S. as well as informative books and "how to" works. Send manuscript with a self-addressed stamped envelope to: Editor/Rowe Publications, 3906 N. 69th Street, Milwaukee, Wis. 53216. 🐠

## PADI DIVE STORE MANAGEMENT GUIDE

After more than two years of extensive preparation, PADI has published a new retail dive store management tool. The book, *The Retail Dive Store: Management and Operations*, by training facility director, Al Hornsby, brings together the industry's first comprehensive store management guide in one volume.

Utilizing tabbed subject-headings and a unique, detailed table of contents, the publication is designed to provide immediate reference for increasing the efficiency and effectiveness of store projects and procedures.

For complete information, write PADI Headquarters, Training Facility Dept., 2064 N. Bush Street, Santa Ana, CA 92706, (714) 953-7555. 🐠



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## CHECK OUR LOW, LOW PRICES BEFORE YOU BUY ANYWHERE!



**U.S. DIVERS' Conshelf XIV**

**99<sup>95</sup>**

**Conshelf Supreme**

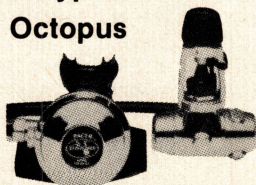
**109<sup>95</sup>**

**Calypso VI**

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**DACOR Pacer 900**

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**Pacer Octopus**

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**TEKNA**

**2100 B**

**139<sup>95</sup>**

**2100**

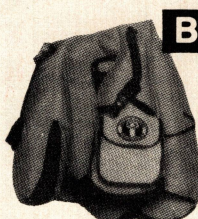
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**POSEIDON**

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With pack and L.P.I.

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With pack and L.P.I.

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Combo CPG, and Oil Filled Depth Gauge

**89<sup>95</sup>**

**DACOR**

**ICL - 150**

**89<sup>95</sup>**

Combo CPG and Oil Filled Depth Gauge

Add \$2.00 shipping for each Gauge ordered

**CALL TOLL FREE**

**1-800-241-1856**

**IN GEORGIA CALL (404) 952-1629**

Use and operation of life support equipment should not be undertaken without qualified and proper instructions in their use. This ad does not imply the sale of life support equipment through the mail.



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\_\_\_\_\_ Knee  
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\_\_\_\_\_ Hips  
\_\_\_\_\_ Waist  
\_\_\_\_\_ Chest  
\_\_\_\_\_ Neck  
\_\_\_\_\_ Wrist  
\_\_\_\_\_ Forearm  
\_\_\_\_\_ Elbow  
\_\_\_\_\_ Biceps  
\_\_\_\_\_ Ankle to Knee  
\_\_\_\_\_ Ankle to Crotch  
\_\_\_\_\_ Ankle to Waist  
\_\_\_\_\_ Shoulder Seam to Crotch  
\_\_\_\_\_ Wrist to Elbow  
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- ☐ GLOVES \$9.95  
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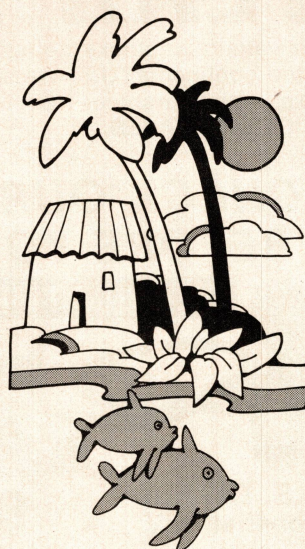
MEN OVER 225 lbs. ADD \$15.00  
WOMEN OVER 180 lbs. ADD \$15.00

Add \$4.00 Postage & Handling SORRY, NO C.O.D. (\$5.00 Canada, plus currency exchange) Clip and Mail This Handy Coupon Today! To: **Skin Diver Wet Suits**  
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Kent, Washington 98031

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_



## Divers Directory



Advertising rate is \$87 for three consecutive ads, \$149 for six consecutive ads, \$229 for a full year. **PAYMENT MUST ACCOMPANY COPY.** Send all material to **Diver's Directory, c/o Skin Diver, 8490 Sunset Boulevard, Los Angeles, CA 90069.**

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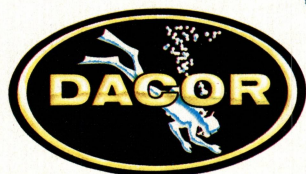


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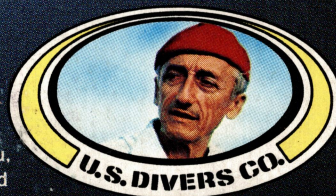


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